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ON SOME ENICOSPILUS-SPECIES FROM THE ORIENT

(HYMENOPTERA: ICHNEUMONIDAE)

By

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ON SOME *ENICOSPILUS*-SPECIES FROM THE ORIENT (Hymenoptera: Ichneumonidae)[1]

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The present paper is based almost entirely upon the collection of the Taiwan Agricultural Research Institute, and naturally most of the species treated are from Formosa (Taiwan), a few further ones are from Korea, Japan, Riu Kius (=Okinawa), Fukien and the Malay Peninsula. Besides the descriptions of 32 new species and 16 neallotypes, supplementary notes on certain known species are also given so as to make them more easily recognizable. The terminology employed in the paper is adapted from CUSHMAN (1937, 1947). To avoid possible confusion, some explanations are given to the following terms:

Antenno-ocellar line—The shortest distance between the median ocellus and either of the two antennal sockets.

Basal area (of propodeum)—The area lying intermediately between the metanotum and transverse propodeal ridge, being smooth or very finely sculptured and thus in strong contrast to the roughly sculptured apical propodeal area.

Basal concavity (of mandible)—The triangular (rarely lunular) depression on the outer surface of a mandible near its base.

Face—A collective name for sides of face and supraclypeal region.

Sides of face—Lateral areas of the face, lying ectad to the supraclypeal region.

Frontal tubercle—The longitudinal (rarely conical) elevation on the median frontal line.

Latero-ocellar line—The shortest distance between the median and either lateral ocelli.

Ocellar triangle—The triangular elevation enclosed by the three ocelli.

Transverse ridge (of propodeum)—The arcuate or undulate carina separating the smooth basal area from the heavily sculptured remaining area of the dorsum of propodeum.

Trans-tentorial furrow—The median portion of the epistomal furrow, connecting the two anterior tentorial pits and separating the clypeus from face.

Relative measurements—All relative measurements except that for the transverse brace are given at the magnification of 40 x.

It should be stated that the male genitalia are rather small, compressed and partly covered with fine hairs and that the figures given in this paper are based

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upon microscopic preparation, in which the natural position of the various parts involved has been more or less altered following maceration and other processes.

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Genus **ENICOSPILUS** STEPHENS, 1835

Genotype: (*Ophion merdarius* STEPHENS, not GRAVENHORST)=*Ophion combustus* GRAVENHORST.

=*Henicospilus* AGASSIZ, 1846. nom. emend. pro *Enicospilus*.

=*Allocamptus* FOERSTER, 1868; THOMSON, 1888 (p. 1186). Genotype: *Ophion combustus* GRAVENHORST, design. CUSHMAN, 1947.

=*Allocamptus* THOMSON, 1888 (p. 1189), not FOERSTER. Genotype: *Ophion undulatus* GRAVENHORST.

=*Dispilus* KRIECHBAUMER, 1894. Genotype: *Ophion* (*Dispilus*) *natalensis* KRIECHBAUMER.

=*Eremotylus* (FOERSTER) ASHMEAD, 1896, not (FOERSTER) THOMSON. Genotype: (*Eremotylus arctiae* ASHMEAD)=*Enicospilus glabratus* (SAY), not (FOERSTER) KRIECHBAUMER.

=*Pleuroneurophion* ASHMEAD, 1900. Genotype: *Pleuroneurophion hawaiiensis* ASHMEAD.

=*Cymatoneura* KRIECHBAUMER, 1901. Genotype: *Ophion undulatus* GRAVENHORST, design. VIERECK, 1912.

=*Pterospilus* KRIECHBAUMER, 1901. Genotype: *Ophion* (*Enicospilus*) *dubius* TOSQUINET, design. VIERECK, 1914.

=*Trispilus* KRIECHBAUMER, 1901. Genotype: *Ophion* (*Enicospilus*) *trimaculatus* TOSQUINET.

=*Eremotylus* (FOERSTER) KRIECHBAUMER, 1901, not (FOERSTER) THOMSON, not (FOERSTER) ASHMEAD. Genotype: *Ophion undulatus* GRAVENHORST, design. CUSHMAN, 1947.

=*Leptophion* CAMERON, 1901. Genotype: *Leptophion longiventris* CAMERON.

=*Dicamptus* SZÉPLIGETI, 1905. Genotype: *Dicamptus giganteus* SZÉPLIGETI.

=*Metophion* SZÉPLIGETI, 1905. Genotype: *Metophion bicolor* SZÉPLIGETI, design. VIERECK, 1914.

=*Ceratospilus* SZÉPLIGETI, 1905. Genotype: *Ceratospilus biroi* SZÉPLIGETI.

=*Atoponeura* SZÉPLIGETI, 1905. Genotype: (*Atoponeura concolor* SZÉPLIGETI, nom. praeocc.)=*Enicospilus atoponeurus* CUSHMAN.

=*Ophiomorpha* SZÉPLIGETI, 1905. Genotype: (*Ophion curvinervis* CAMERON, nom.

praeocc.)=*Ophion cameronii* DALLA TORRE, design. HOOKER, 1912.
=*Cryptocamptus* BRETHES, 1909. nom. nov. pro *Allocamptus* THOMSON, not FOERSTER.
=*Eremotyloides* PERKINS, 1914. Genotype: *Eremotylus orbitalis* ASHMEAD.
=*Amesospilus* ENDERLEIN, 1918. Genotype: *Ophion unicallosus* VOLLENHOVEN.
=*Schizospilus* SÉYRIG, 1935. Genotype: *Schizospilus divisus* SÉYRIG.

Synopsis of the species enumerated

1. Fenestra of fore wing entirely colorless and uniformly, very weakly sclerotized, without any trace of sclerome or scleromes.…… *orientalis* (UCHIDA)

–. Fenestra with 1 to 3 more or less well-defined scleromes.……2

2 (1). Fenestra of fore wing always with a transversely linear, weakly sclerotized, slightly curved proximal sclerome; central and distal scleromes never present; discocubitus never distinctly angulated at or near midpoint. ……3

–. Fenestra without a proximal sclerome, or when present, triangular and strongly sclerotized, never linear and weakly sclerotized; central and distal scleromes often present; discocubitus variable. ……4

3 (2). Propleura striate; scutellum subpolished; 2nd recurrent and basal abscissa of subdiscoideus almost perpendicular to each other; pterostigma and metacarpus of fore wing testaceous, conspicuously paler than costa. …… *transversus*, sp. nov.

–. Propleura punctato-striate; scutellum punctate; 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse interior angle; pterostigma and metacarpus blackish, and thus concolor with costa.…… *sinuatus* (MORLEY)

4 (2). Quadra of fore wing very large, about 1/7 as long as 1st radial abscissa, basally bifurcate, poorly defined, apically sharply defined and rounded off; radial cell basally with a hairless, fenestra-like area, which is nearly as long and as broad as quadra; distal sclerome hairy on both surfaces, lying outside fenestra; proximal and central scleromes absent.…… *exaggeratus*, sp. nov.

–. Quadra never as described abve; radial cell (except in *concentralis*) never with such an extensive fenestra-like area; distal sclerome often hairless and often lying inside fenestra; proximal and central scleromes often present.……5

5 (4). Fore wing with 2 strongly sclerotized and deeply pigmented central scleromes, one subtriangular and another roundish; proximal sclerome absent; distal sclerome represented by a long, narrow, curved, very feeble streak; 2nd discoidal cell long, narrow, broadest at middle; discocubitus evenly curved and uniform in thickness.…… *gyochiensis* (UCHIDA)

–. Fore wing at most with only 1 central sclerome; proximal sclerome almost always present and conspicuous; distal sclerome, 2nd discoidal cell and discocubitus variable.....6

6 (5). Distal sclerome always larger, more strongly sclerotized or more deeply pigmented than central and proximal ones, which are almost always entirely irrecognizable; head always strongly narrowed behind eyes.....7

–. Distal sclerome absent, when present, then always smaller, more weakly sclerotized or less deeply pigmented than others; proximal sclerome always large and conspicuous; head variable.....9

7 (6). Proximal sclerome well defined, although very small; distal sclerome weakly but distinctly S-shapedly curved; discocubitus uniform in thickness.....*flatus*, sp. nov.

–. Proximal sclerome untraceable; distal sclerome not S-shapedly curved; discocubitus variable.....8

8 (7). Discocubitus practically in uniform thickness; distal sclerome a little narrower than maximum thickness of radial abscissa; 2nd discoidal cell with an obtuse analo-apical angle; pterostigma testaceous, distinctly paler than costa.....*uniformis*, sp. nov.

–. Discocubitus markedly thickened at its geniculation; distal sclerome almost twice as wide as maximum thickness of 1st radial abscissa; 2nd discoidal cell with a 90° analo-apical angle; pterostigma blackish, concolor with costa. .....*fusiformis*, sp. nov.

9 (6). Central sclerome more or less well-defined.....26

–. Central sclerome untraceable, so that quadra entirely colorless and in uniform thickness.....10

10 (9). Scutellum (excluding the extremely basal portion) laterally rounded-off, not sharply edged; abdominal tergum I much longer than II; body size very large, fore wing about 18–25 mm. long.....11

–. Lateral scutellar margins entirely, distinctly carinated; abdominal tergum I as long as, shorter than, or at most a little longer than II; body size small to moderate, fore wing about 10–20 mm. long.....12

11 (10). Basal mandibular concavity subtriangular, comparatively deep; transverse brace of fore wing about 2:2:2; proximal and distal scleromes both weakly sclerotized, although the former being far more deeply pigmented; radial cell hairy throughout.....*uchidae*, nom. nov.

–. Basal mandibular concavity lunular, comparatively shallow; transverse brace about 2:2·5:2; proximal and distal scleromes both strongly sclerotized, and the former being scarcely more deeply pigmented; radial cell basally with an extensive fenestra-like area.....*nigropictus* (MATS.)

12 (10). Scutellum scarcely narrowed posteriorly, but more or less transversely rugose; proximal sclerome transverse, subtriangular, with antero-basal

margin about 1.5 time as long as apical margin; middle portion of lst radial abscissa about 4 times as thick as apical. ····· *nigrostemmaticus* (ENDERL.)

–. Scutellum strongly narrowed posteriorly, lacking distinct transverse rugae; proximal sclerome not triangular or subtriangular, or when so, then antero-basal margin (except in *isshikii*, which can be further distinguished by much shorter 2nd discoidal cell, about 56 x 20; in *nigrostemmaticus*, it is 90 x 28) as long as or shorter than apical; lst radial abscissa not so strongly thickened at middle.·····13

13 (12). Mesopleura distinctly striate, the striae on inferior half being exceedingly strong and well separated; metapleura roughly reticulate; discoidella almost perpendicular to superior nervellar abscissa which is more than thrice as long as inferior.·····*zyzzus*, sp. nov.

–. Mesopleura glabrous, micropunctate or punctato-striate, the superior half never with distinct striation and inferior half never strongly striate; metapleura punctate, striato-punctate or transversely carinate never roughly reticulate; discoidella and superior nervellar abscissa forming an obtuse interior angle, the latter often not more than thrice as long as inferior. ····· 14

14 (13). Metapleura with about 9 well developed transverse carinae extending to inferior metapleural margin; proximal sclerome roundish and exceptionally strongly sclerotized; intercubitus subequal in length to 2nd cubital abscissa.·····*triguttatus* (UCHIDA)

–. Metapleura not transversely carinate, or the carinae never extending to inferior metapleural margin; proximal sclerome not as above; intercubitus much shorter than 2nd cubital abscissa.·····15

15 (14). Petiolar area of propodeum bearing a number of concentric carinae.·····16

–. Petiolar area rugose or rugolose, lacking concentric carinae.·····23

16 (15). Propodeum not separated from metapleuron, at most by a longitudinal furrow.····· ·····17

–. Propodeum sharply separated from metapleuron by a distinct, continuous carina.·····19

17 (16). Metapleura evenly, finely punctate; proximal sclerome roundish; quadra slender (Fig. 45).·····*tenuinubeculus*, sp. nov.

–. Metapleura striato-punctate or transversely carinate; proximal sclerome never roundish; quadra broad (Figs. 35 & 22).····· ·····18

18 (17). Metapleura delicately striato-punctate; proximal sclerome transversely linear.····· ····· *pundibundae* (UCHIDA)

–. Metapleura distinctly, transversely carinate; proximal sclerome subtriangular.····· *maai*, sp. nov.

19 (16). Mandible exceedingly strongly twisted; superior half of metapleura trans-

versely carinate, inferior half micropunctate; distal sclerome well-defined; ocellar triangle black.····· *laticarinatus*, sp. nov.

–. Mandible moderately twisted; metapleura uniformly, delicately striato-punctate; distal sclerome irrecognizable; ocellar triangle testaceous.·····20

20 (19). Proximal sclerome transverse, anteriorly truncate; appendix very short; distal sclerome wanting.····· *pseudoconspersae* (SONAN)

–. Proximal sclerome subtriangular or anteriorly rounded; appendix long or absent; distal sclerome present or wanting.·····21

21 (20). Proximal sclerome subtriangular; appendix and distal sclerome wanting; costa and pterostigma concolor.····· *shinkanus* (UCHIDA)

–. Proximal sclerome oval or elbowed; appendix and distal sclerome variable; costa blackish, distinctly duller than pterostigma.·····22

22 (21). Proximal sclerome oval, very small, without an appendix; analo-apical angle of 2nd discoidal cell a little greater than 90°.····· *striatus* CAMERON

–. Proximal sclerome elbowed, large, with a distinct appendix; analo-apical angle of 2nd discoidal cell distinctly smaller than 90°.····· ····· *gephyrus*, sp. nov.

23 (15). Clypeus strongly convex, with anterior marginal area abruptly deflexed, forming a rather distinct, transverse, submarginal carina; 2nd discoidal cell exceptionally short and broad, about 58 x 25; proximal sclerome trapezoidal, much longer than wide, exceedingly strongly sclerotized, apically widened; appendix short, subtriangular, basally very broad; pterostigma and costa concolor, blackish; abdomen bicolor, segments VI-VIII black.····· ····· *isshikii* (UCHIDA)

–. Clypeus not as described above; 2nd discoidal cell moderately long and narrow, from about 65 x 15 to 72 x 22; proximal sclerome triangular or subtriangular, moderately sclerotized; appendix, when present, linear and long; pterostigma testaceous, concolor with or paler than costa; abdomen unicolor. ·····24

24 (23). Clypeus anteriorly strongly convex, with anterior margin protruding out and overhanging the strongly deflexed labrum, making general curvatures of clypeus and labrum almost perpendicular to each other; superior nervellar abscissa and discoidella forming a right angle; abdominal tergum I distinctly shorter than II.····· *iracundus*, sp. nov.

–. Clypeus weakly or evenly convex, with general curvature more or less in line with that of frons or labrum, and anterior margin more or less sloping downwards; superior nervellar abscissa and discoidella forming a narrow, obtuse interior angle; abdominal tergum I not or scarcely shorter than II. ·····25

25 (24). Mandible exceedingly strongly twisted, basal concavity lunular, well-defined;

clypeus nose-like in profile, and much more finely and shallowly punctate than supraclypeal region; costa blackish, distinctly duller than pterostigma. ..... *yonezawanus* (UCHIDA)

–. Mandible moderately twisted, basal concavity ill-defined; clypeus never nose-like in profile, but similarly punctate as supraclypeal region; costa testaceous, concolor with pterostigma. ..... *relictus*, sp. nov.

26 (9). Discocubitus strongly thickened, angulated at a point of basal 3rd, and bearing a whitish spot at basal 2/3. ..... *flavocephalus* (KBY.)

–. Discocubitus evenly slender, never strongly thickened near middle, never distinctly angulated at basal 3rd, and the whitish spot usually lying very near apex. 27

27 (26). Central and distal scleromes both very long, slender, strongly curved and parallel to each other. 28

–. Central sclerome variform, if transversely linear, then never strongly curved and never parallel to distal sclerome. 29

28 (27). Meso- and metapleura striate; radial cell basally with an extensive fenestra-like area; analo-apical angle of 2nd discoidal cell smaller than 90°; discocubitus evenly, gently curved. ..... *concentralis* CUSHMAN

–. Meso- and metapleura punctate; radial cell without such an area; analo-apical angle of 2nd discoidal cell greater than 90°; discocubitus very sharply geniculated at a point of apical 3rd. ..... *saepis*, sp. nov.

29 (27). Central sclerome transversely linear with average distance to discocubitus about 4 times that to radius; 2nd discoidal cell very long, about 105 x 25; costa blackish, always duller than pterostigma. 30

–. Central sclerome not transversely linear, when rarely so, then lying nearly intermediately between radius and discocubitus; 2nd discoidal cell and costa variable. 31

30 (29). Lateral scutellar margins anteriorly strongly but posteriorly very weakly carinate; propodeum distinctly reticulate, more or less with a roundish median concavity near apex. ..... *concavus*, sp. nov.

–. Lateral scutellar margins evenly, strongly carinate; propodeum roughly, longitudinally so. ..... *tainanensis* (UCHIDA)

31 (29). Central sclerome linear, oblique, parallel to pterostigma, apically very slightly widened; 2nd discoidal cell very short, about 55 x 25, widest near middle, basally strongly narrowed. ..... *obliquus*, sp. nov.

–. Not as above. 32

32 (31). Central sclerome transverse, parallel or subparallel to and equidistant from radius and discocubitus. 33

–. Central sclerome not as described above, most in roundish and lying more closely to radius rather than to discocubitus. 36

33 (32). Proximal sclerome ob-pyriform, exceptionally strongly sclerotized; central

sclerome twice as broad as long; cubital abscissa about 4 times as long as intercubitus.·····*bullatus*, sp. nov.

–. Proximal sclerome triangular, never exceptionally strongly sclerotized; central sclerome at least thrice as broad as long; cubital abscissa less than thrice as long as intercubitus.·····34

34 (33). Meso- and metapleura uniformly micropunctate; proximal sclerome transverse, about 4 times as broad as long; 2nd discoidal cell wide, widest at middle, narrowed apically and with a narrowly obtuse analo-apical angle. ·····*zeugos*, sp. nov.

–. Meso- and metapleura never uniformly micropunctate, but more or less striato-punctate or only metapleura micropunctate; proximal sclerome triangular, never more than twice as broad as long; 2nd discoidal cell relatively narrow, not widest at middle (or not narrowed apically) and with an acute analo-apical angle.·····35

35 (34). Metapleura distinctly punctate, not striate, and distinctly more shining than mesopleura; central sclerome parallel to radius; apical 2/5 of discocubitus equidistant from radius and subdiscoideus.·····*sauteri* (ENDERL.)

–. Metapleura distinctly transversely striate, and not more shining than mesopleura; central sclerome apically slightly divergent from radius; apical 2/5 of discocubitus lying more closely to subdiscoideus rather than to radius.·····*molopos*, sp. nov.

6 (32). Central sclerome (Fig. 89) large, subtriangular, subparallel to radius and apically strongly narrowed and slightly divergent from discocubitus; 2nd discoidal cell widest near base; discocubitus strongly curved at a point of basal 3rd.·····*bifasciatus* (UCHIDA)

3–. Central sclerome differently shaped or unparallel to radius; 2nd discoidal cell never widest near base; discocubitus, if strongly curved, then mostly at apical (not basal) 3rd.·····37

37 (36). Mesopleura striate, superior half usually with a number of very indistinct punctures.·····38

–. Mesopleura punctate or striato-punctate, superior area (and often inferior area also) always with distinct or very distinct punctures, inferior area always punctato-striate.·····42

38 (37). 2nd discoidal cell more than thrice as long as wide, with an obtuse analo-apical angle. ·····39

–. 2nd discoidal cell less than thrice as long as wide, with an acute analo-apical angle. ·····41

39 (38). Clypeus nose-like, exceptionally strongly swollen; central sclerome elongate, never lunate; distal sclerome rather heavily sclerotized.·····*nasutus*, sp. nov.

–. Clypeus normal, never nose-like; central sclerome roundish; distal sclerome weakly sclerotized. ……40

40. Central sclerome lunate, more strongly sclerotized than distal sclerome; abdomen uniformly testaceous.…… *cushmani*, nom. nov.

–. Central sclerome semicircular, as feebly sclerotized as distal sclerome; abdominal tergum III and its followings with a median black line.…… ……*chalasmatos*, sp. nov.

41 (38). Distal sclerome as heavily sclerotized as proximal sclerome; sides of thorax dominantly dark brown to black.……*tristrigatus* (ENDERL.)

–. Distal sclerome less heavily sclerotized than proximal sclerome; sides of thorax dominantly testaceous. …… *taiwanus* (UCHIDA)

42 (37). Central and proximal scleromes concolor, lightly sclerotized, and more or less distinctly duller than distal sclerome. ……43

–. Central and distal scleromes concolor, lightly sclerotized and more or less distinctly paler than proximal sclerome.……54

43 (42). Appendix of proximal sclerome lightly but distinctly pigmented, concolor with distal sclerome, rarely duller than the latter.……49

–. Appendix of proximal sclerome colorless, so that proximal and distal scleromes clearly independent to each other.……44

44 (43). Discocubitus distinctly angulated near a point of apical 3rd, and without a pale interruption ("alar fenestra"); distance between antennal sockets markedly shorter than that from central ocellus to inner orbit.…… ……*yanagiharai* (SONAN)

–. Discocubitus at most gently curved, never angulated, and always with a quite well-defined pale interruption near apex; distance between antennal sockets more or less longer than that from central ocellus to inner orbit. ……45

45 (44). Proximal sclerome isoscelesly triangular; 2nd recurrent about 5/7 (25:35), as long as the greatest width of 2nd discoidal cell.……*fossatus*, sp. nov.

–. Proximal sclerome scalenely triangular; 2nd recurrent almost equal to or at least 6/7 (30:35) as long as the greatest width of 2nd discoidal cell.…… ……46

46 (45). Lateral scutellar margins entirely, distinctly carinate; abdomen unicolor. ……47

–. Lateral scutellar margins posteriorly not or scarcely carinate; abdomen bicolor, apically black, basally yellowish, in strong contrast.……48

47 (46). Proximal sclerome ob-pyriform; central sclerome subtriangular, slightly longer than wide; 2nd cubital abscissa longer than 2nd recurrent.…… …… *leetoni*, sp. nov.

–. Proximal sclerome triangular; central sclerome transversely ovoid, dis-

tinctly shorter than wide; 2nd cubital abscissa shorter than 2nd recurrent. .... ***tripartitus***, sp. nov.

48 (46). Central sclerome tadpole-like; scutellum posteriorly finely punctate, not striate; clypeus as densely punctate as supraclypeal region; relative lengths of superior and inferior nervellar abscissae about 18:16. .... ***ranunculus***, sp. nov.

–. Central sclerome roundish; scutellum posteriorly striate; clypeus distinctly more sparsely punctate than supraclypeal region; relative lengths of superior and inferior nervellar abscissae about 20:10. .... ***ramidulus*** (LINN.)

49 (43). Appendix of proximal sclerome very weakly sclerotized; central sclerome roundish or irregular in shape; distal sclerome colorless; 2nd discoidal cell long and narrow (about 35 x 10). 50

–. Appendix of proximal sclerome almost uniformly heavily sclerotized; central sclerome always pigmented; 2nd discoidal cell comparatively short and broad. 52

50 (49). Inferior margin of supraclypeal region distinctly more elevated than clypeus; central sclerome transversely ellipsoid; scutellum posteriorly distinctly, longitudinally multi-striate. ..... ***receptor***, sp. nov.

–. Inferior margin of supraclypeal region never more elevated than clypeus; central sclerome subtriangular, posteriorly strongly emarginate; scutellum posteriorly not or scarcely striate, at most with a strong median keel. 51

51 (50). Distal sclerome about thrice as broad as appendix; scutellum posteriorly with a strong median keel. ..... ***selmatos***, sp. nov.

–. Distal sclerome almost as broad as appendix; scutellum never with such a keel. ..... ***glabrifacies***, sp. nov.

52 (49). Metapleura punctato-striate, inferior half usually striate; abdomen bicolor. 53

–. Metapleura punctate, at most inferior 3rd striato-punctate; abdomen unicolor. ..... ***quintuplex***, sp. nov.

53 (52). Pterostigma as well as costa of fore wing testaceous; discoidella and superior nervellar abscissa perpendicular to each other. .... ***analis*** (MATS. & UCHIDA)

–. Pterostigma as well as costa blackish; discoidella and superior nervellar abscissa forming an obtuse interior angle. .... ***nigrivenalis*** CUSHMAN

54 (42). Metapleura distinctly reticulated; 2nd discoidal cell excessively long, about 135 x 35; proximal sclerome with both lateral sides convexly curved. ..... ***crucis***, sp. nov.

–. Metapleura evenly punctate or laterally striato-punctate, never reticulated; 2nd discoidal cell moderately long, about 100 x 35; proximal sclerome never convexly curved.····· 55

55 (54). Head suddenly narrowed behind eyes; basal mandibular concavity crescent-shaped, distinctly broader than long; appendix of proximal sclerome colorless; meso- and metapleura more or less striato-punctate.····· ·····*multidens*, sp. nov.

–. Head gradually narrowed behind eyes; basal mandibular concavity triangular, about as long as broad; appendix of proximal sclerome pigmented, concolor or almost concolor with distal sclerome; mesopleura (superior area) and metapleura with well separated punctures.····· 56

56 (55). Clypeus evenly, weakly convex; labrum only about 2/5 as long as and basally overlapped by clypeus.·····*seniculus*, sp. nov.

–. Clypeus evenly, strongly convex, nose-like, with a distinct inferior slope; labrum about 2/3 as long as and never overlapped by clypeus.····· 57

57 (56). Scutellum anteriorly deeply depressed, posteriorly strongly convex; supra-clypeal region and superior clypeal margin lying on same plane; basal 2/3 of discocubitus very gently curved, not undulated.·····*shikokuensis* (UCHIDA)

–. Scutellum anteriorly scarcely depressed, posteriorly gradually rounded-off into the posterior slope; supraclypeal region distinctly more raised than superior clypeal margin; basal 2/3 of discocubitus distinctly undulated. ·····*sigmatoides*, sp. nov.

Enicospilus orientalis (UCHIDA)

1928 *Allocamptus orientalis* Uchida, Jour. Fac. Agric. Hokkaido Univ., 21:230, pl. 7, fig. 7, ♀ ♂ (Formosa: Akô, Baibara; R'u Kius).

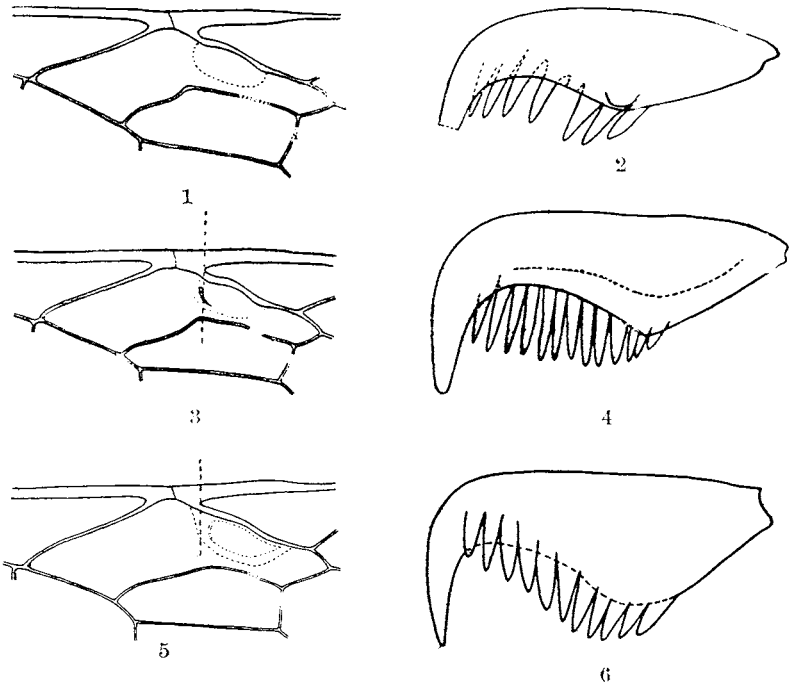
The following notes may be supplementary to the description by UCHIDA.

♀ ♂. Mandible exceedingly strongly twisted; basal concavity lunular, feebly punctate. Labrum about 1/2 as long as malar space. Clypeus about 17 x 25, rather convex; trans-tentorial furrow irrecognizable. Face finely punctate. Frontal tubercle linear, obscure. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle distinctly raised. Greatest widths of temple and eye in profile about 11:33. Mesopleural cavity rather shallow, short and nearly straight.

Forewing 15 mm. long. Fenestra (Fig. 1), small extending from base to apical 5/8 of 1st radial abscissa. Radius with 1st abscissa moderately bisinuate, and about 1/2 as long as 2nd abscissa; transverse brace approximately in the ratio 2: 1.8:2.7(28:25:38); 2nd recurrent and basal abscissa of subdiscoideus forming a narrowly obtuse angle, the latter nearly thrice as long as the former. Discocubitus strongly geniculate basad to middle, occasionally with a short ramellus; nervulus antefurcal

or interstitial. Superior and inferior nervellar abscissae about 32:11, the former and discoidella forming a narrowly obtuse angle. Hind claw as in Fig. 2.

Abdominal segment I longer than II, the former weakly curved in profile, apical width slightly greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, basad to middle.



Figs. 1-6. Fenestrae and hind claws of *Enicospilus orientalis* (UCHIDA) ♀ (1, 2). *E. sinuatus* (MORL.) ♀ (3, 4), and *E. transversus*, sp. nov. ♀ (5, 6).

Formosa: Kagi, 1♀; Taihoku. 1♀, 3 ♂♂. Fukien: Foochow, 1♀.

Enicospilus sinuatus (MORL.)

1913 *Allocamptus sinuatus* MORLEY, Faun. Brit. Ind. Hym., 3:374, ♂♀ (India: Punjab, Bengal, Karen Hills; Ceylon).

♂♀. Mandible exceedingly strongly twisted; basal concavity poorly defined; superior and inferior teeth subequal in length. Labrum about 7/11 as long as malar space. Clypeus about 20 x 30, very weakly convex, feebly, sparsely punctate; trans-tentorial furrow scarcely recognizable. Frontal tubercle oval, rather prominent. Antenno-ocellar and latero-ocellar lines subequal. Greatest widths of temple and eye in profile about 16:40.

Propleura evenly, finely punctato-striate. Mesonotum granulated. Mesopleura finely, closely punctate, obscurely striate. Mesopleural cavity broad, shallow. Scutellum sparsely, coarsely, shallowly punctate and more or less striated near apical half, laterally sharply margined. Propodeum roundish, apical area with

numerous, regularly arranged and roundly curved carinae; transverse ridge arcuate, moderately strong.

Forewing 21 mm. long. Fenestra (Fig. 3) small, extending from nearly base to apical 3/7 of 1st radial abscissa, the latter about 6/11 as long as 2nd abscissa; proximal sclerome poorly developed; quadra ill-defined; transverse brace approximately in the ratio 2:1.9:2.6 (36:35:48); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle, the latter about thrice as long as the former; discocubitus strongly geniculated basad to middle, sometimes with a short ramellus; nervulus antefurcal. Superior and inferior nervellar abscissae about 50:17, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 4.

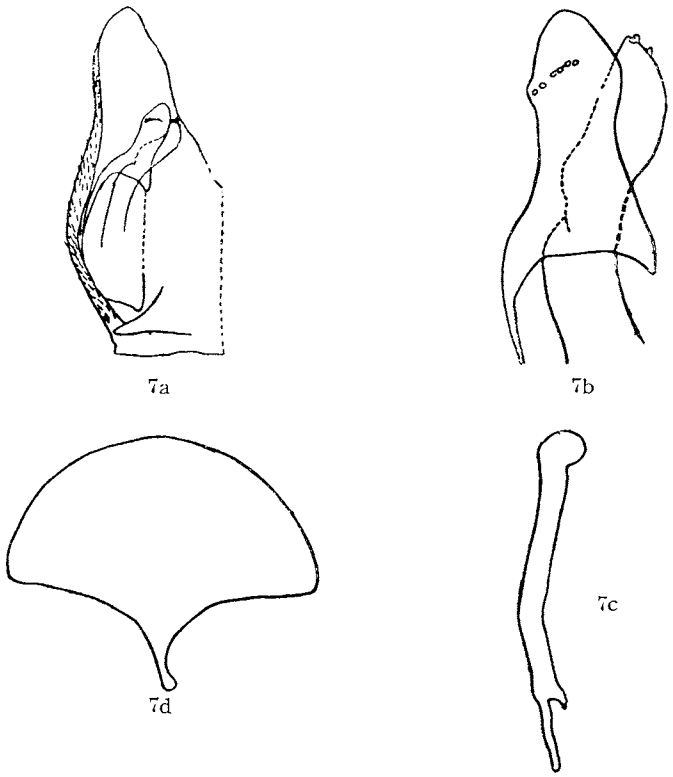


Fig. 7 (a-d). Male genitalia of *Enicospilus sinuatus* (MORL.)—7a. dorsal view of right-hand paramere (with volsella), 7b. right-hand volsella (more enlarged), 7c. right lateral plate of aedeagus, 7d. hypandrium.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width slightly greater than trans-spiracular width. Tergum II with spiracles lying basad to apical 1/3; gastrocoeli, basad to middle. Genitalia as in Fig. 7.

Formosa: Chipon, 1♀; Horisha, 1♂; Kuraru, 1♀; Shinchiku, 1♀; Sozan, 1♀; Taihoku, 3♀♀, 1♂.

Japan: Tamaru, 1♀.

Enicospilus transversus, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible strongly twisted, basal concavity triangular. Labrum slightly narrower than clypeus, about 4/5 as long as malar space. Clypeus about 20 x 35; trans-tentorial furrow scarcely recognizable. Face subpolished, obscurely punctate. Frontal tubercle roundish, prominent. Antenna thick, shorter than body; antenno-ocellar line: latero-ocellar line about 12:18. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 14:38.

Propleura evenly, finely striate. Mesonotum rather finely punctate; mesopleura punctate, intermixed with numerous, fine striae; mesopleural cavity curve, long and shallow. Scutellum subpolished, laterally sharply margined, apically with a few irregular rugae. Propodeum rounded, apical area with numerous strong, arcuate carinae, basally with a few transverse ones; transverse ridge undulate, moderately strong.

Forewing 20 mm. long. Fenestra (Fig. 5) large, extending from base to apical 1/3 of 1st radial abscissa; proximal sclerome short, linear, curved and poorly developed; quadra ill-defined. Radius with 1st abscissa slightly sinuate, basally thickened, about 2/3 as long as 2nd abscissa; transverse brace approximately in the ratio 2:4:3.3 (26:50:43); discocubitus gently geniculate; 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about thrice as long as the former; nervulus antefurcal. Superior and inferior nervellar abscissae about 37:18, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 6.

Abdominal segment I subequal in length to II, almost straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, immediately basad to middle.

Testaceous. Mandibular apices, costa, basal, subcostella and base of median and submedian cells brown to dark brown.

Holotype ♀ : Formosa, Taihoku, 4. I. 1924 (J. SONAN).

Paratype: Formosa, Taihoku, 1♀.

A close relative of *E. sinuatus* (MORL.) Besides the characters given the synopsis (couplet 3), it can be recognized from the latter species by the less strongly sinuate radial abscissa, larger fenestra, broader apically discocubital cell, more roundly curved discocubitus and broader tarsal claws. The specific name "*transversus*" refers both to the transversely carinated metapleura and transversely located proximal sclerome.

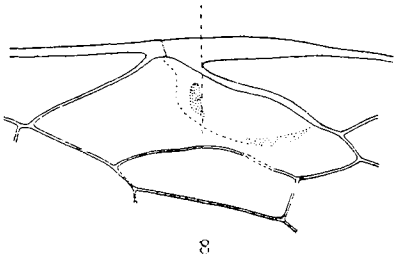
Enicospilus pseudoconspersae (SONAN)

1927 *Henicospilus pseudoconspersae* SONAN, Rept. Dept. Agric. Govern. Formosa, 29:48, pl. 2, fig. 14, ♂ (Formosa: Taihoku).

♂. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted;

basal concavity poorly defined. Labrum about as long as malar space. Clypeus about 20 x 15, evenly convex; trans-tentorial furrow scarcely recognizable. Frontal tubercle ovoid, rather prominent. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle raised. Greatest widths of temple and eye in profile about 11:27.

Pro- and mesopleura with an intermixture of punctures and rather short striae; mesopleural cavity moderately short, broad and shallow. Scutellum sparsely, coarsely punctate, laterally sharply margined. Propodeum rounded, apical area faintly sculptured, basally with oblique and apically somewhat arcuate carinae; transverse ridge weakly developed.



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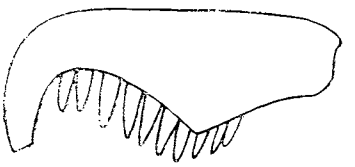

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Figs. 8-9. *Enicospilus pseudoconspersae* (SONAN); 8, fenestra (8), hind claw (9).

Forewing 12 mm. long. Fenestra (Fig. 8), long extending from base to apical 1/6 of 1st radial abscissa; proximal sclerome weakly sclerotized, hairless both above and below; quadra ill-defined. Radius with 1st abscissa (except for the apical 1/6) almost uniformly thickened; and about 7/10 as long as 2nd abscissa; transverse brace about 2:3.6:2.6 (20:36:26); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about thrice as long as the former; 2nd discoidal cell broadest at middle, and very weakly geniculated thereabout; nervulus antefurcal. Superior and inferior nervellar abscissae about 24:12, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 9.

Abdominal segment I subequal in length to II, and feebly curved in profile,

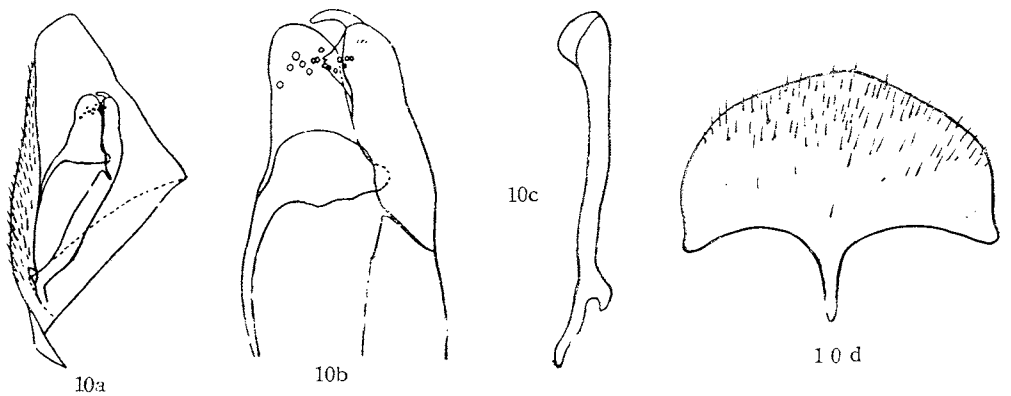


Fig. 10(a-d). Male genitalia of *Enicospilus pseudoconspersae* (SONAN) 10a. dorsal view of right-hand paramere (with volsella), 10b. right-hand volsella (more enlarged), 10c. right lateral plate of aedeagus, 10d. hypandrium.

apical width slightly greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, just at middle. Genitalia as in Fig. 10.

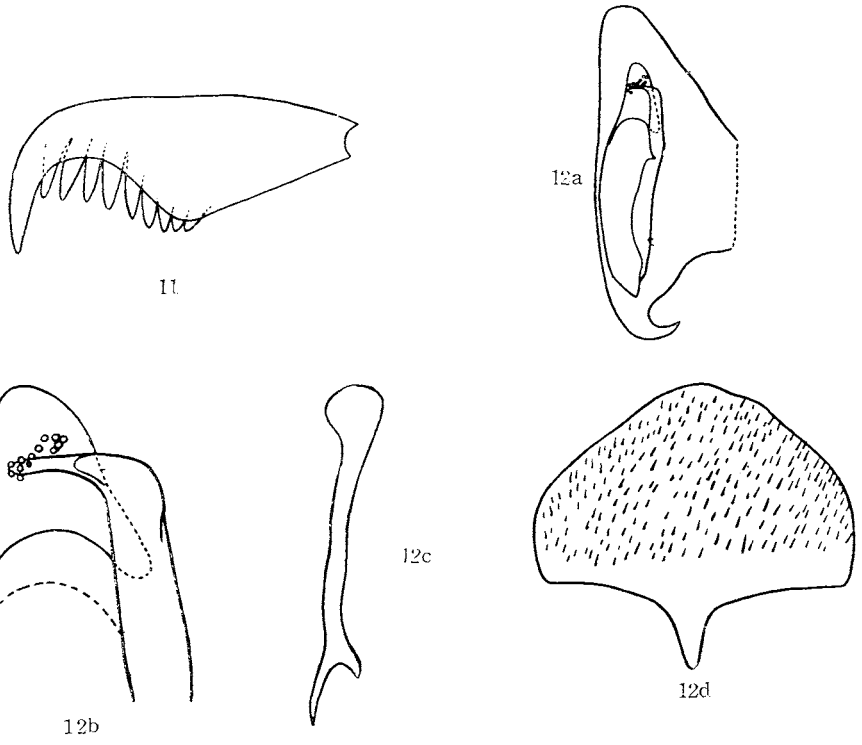
Enicospilus nigrostemmaticus (ENDERL.)

1921 *Amesospilus nigrostemmaticus* ENDERLEIN, Stett. Ent. Zeitg., 82:19, ♂♀ (Sumatra: Soekaranda, Liangagas).

1928 *Henicospilus fuscomaculatus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:216, pl. 7, fig. 5, ♀♂ (Formosa: Baibara; Japan: Honshu, Kiushu, Shikoku; Korea: Shakôji).

1937 *Enicospilus nigrostemmaticus* CUSHMAN, Arb. morph. tax. Ent. Berl-Dahl. 4:304, fig. 8. (Formosa).

♂♀. Mandible exceedingly strongly twisted; basal concavity equilaterally triangular, rather deep. Labrum about as long as malar space. Clypeus evenly convex, about 12 x 24; trans-tentorial furrow well or poorly defined. Supraclypeal region usually flattened, occasionally weakly convex. Frontal tubercle small, oblong, rather prominent. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle very slightly raised. Greatest widths of temple and eye in profile about 10:32. Mesopleural cavity small, rounded and moderately deep. Scutellum rugose near middle and coarsely, longitudinally striate at apical 1/2. Transverse ridge strong, arcuate. Superior and inferior nervellar abscissae about 22:11, the former and discoidella forming an obtuse angle. Abdominal segment I feebly curved in profile, apical width subequal to or distinctly greater than trans-spiracular width. Tergum



Figs. 11-12(a-d). *Enicospilus nigrostemmaticus* (ENDERL.) hind claw ♀ (11) and male genitalia—12a. dorsal view of right-hand paramere (with volsella), 12b. right-hand volsella (more enlarged), 12c. right lateral plate of aedeagus, 12d. hypandrium.

II with spiracles lying at apical 1/3; gastrocoeli, basad to middle. Hind claw and

genitalia as in Figs. 11 and 12 respectively.

Ocellar triangle, mesonotal stripes, mesopleura (excluding superior corners, sometimes posterior margin also) and a mark near base of radial cell dark brown to black.

Formosa: Baibara, 1♂ ; Botel-Tobago, 1♂, 1♀ ; Chipon, 1♂ ; Hassen-zan, 1♀ ; Koshun, 1♀ ; Shonan (Rato), 1♂ ; Taihoku 1♂, 1♀.

Fukien : 1♀.

Japan: Kyushu (Sobosan), 1♂.

Riu Kius: 1♂.

Philippines: Atong Atong, Basilan, 1♂.

Among the specimens examined, the male from Formosa, Koshun, 22–23. XI. 1947 is slightly different from typical ones in having veins of transverse brace approximately in the ratio 2:6:4(12:36:25) instead of 2:6:3.

Enicospilus shinkanus (UCHIDA)

1928 *Henicospilus shinkanus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:217, ♀ (Formosa: Shinka).

1937 *Enicospilus shinkanus* CUSHMAN, Arb. morph. tax. Ent. Berl.-Dahl. 4:307–308, fig. 5, ♀ (Formosa: Koshun).

♀. Mandible strongly twisted; basal concavity longly triangular. Labrum about as long as malar space. Clypeus about 12 x 22, anteriorly truncate; transtentorial furrow irrecognizable. Antenno-ocellar line: latero-ocellar line about 13:15. Ocellar triangle raised. Greatest widths of temple and eye in profile about 11:32. Mesopleural cavity oblong, rather shallow. Radius with 1st abscissa about 8/11 as long as 2nd abscissa. Superior and inferior nervellar abscissae about 22:8, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 13. Abdominal segment I subequal in length to II, feebly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, far basad to middle. Forewing 12 mm. long.

♂ (Undescribed). Similar to female almost in all respects. Genitalia as in Fig. 14.

Allotype ♂ : Formosa, Taihoku, VI. 1910 (I. NITOBE).

Parallotype: Daitozima, 1♂.

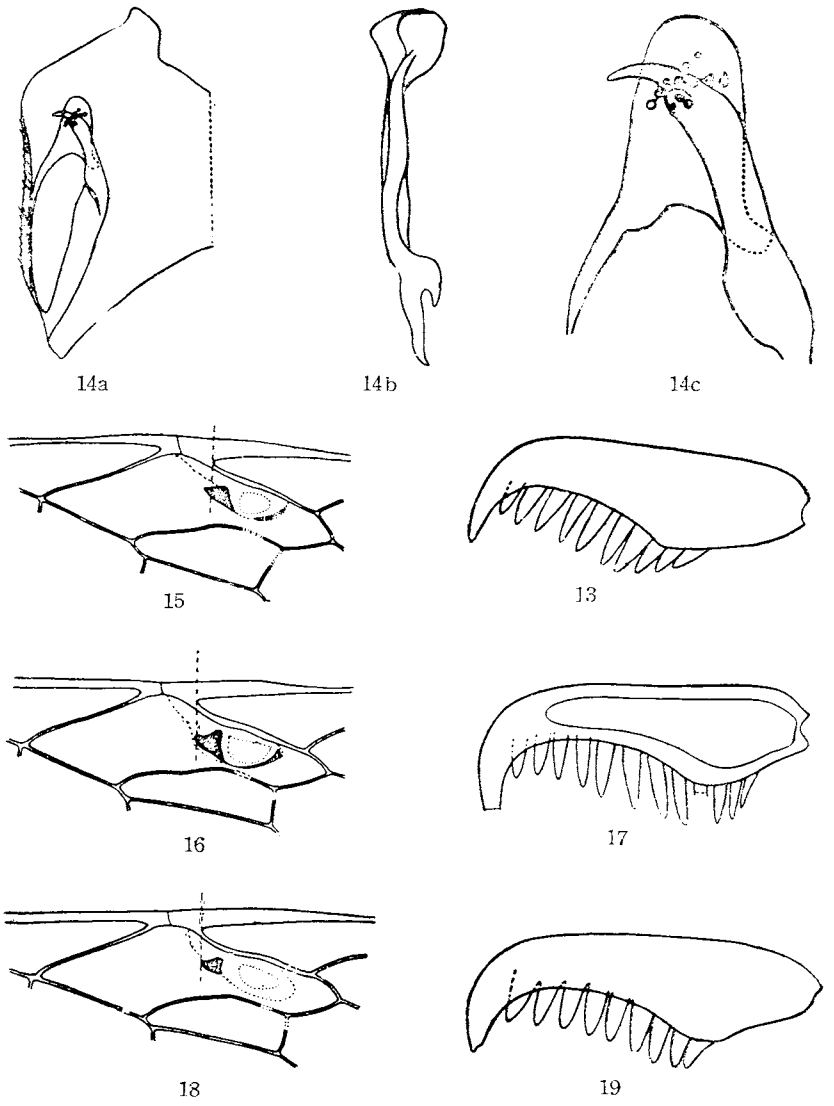
Further specimens: Formosa, Arisan, 1♀ ; Suigen-Kankei, 1♀ ; Taihoku, 2♀♀ ; Urai, 1♀.

Enicospilus iracundus, sp. nov.

♂. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity lunular. Labrum about 4/5 as long as malar space. Clypeus about 18 x 35, feebly punctate, inferiorly strongly raised, with inferior margin protruding out, overhanging the strong deflexed labrum, making general curvatures of clypeus and

labrum almost perpendicular to each other. Trans-tentorial furrow irrecognizable. Face finely punctate. Frontal tubercle oval, slightly prominent. Antenno-ocellar line : latero-ocellar line about 10 : 15. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 15 : 48.

Propleura finely punctate, with few striae near scrobes. Mesonotum finely punctate, mesopleura superiorly finely punctato-striate and inferiorly with numerous distinct striae; mesopleural cavity straight, shallow. Metapleura finely punctate,



Figs. 13-19. Hind claw ♀ (13) and male genitalia (14a—14c) of *Enicospilus shinkanus* (UCHIDA) —14a. dorsal view of right-hand paramere (with volsella), 14b. right-hand volsella (more enlarged), 14c. right lateral plate of aedeagus. Fenestra of *E. iracundus*, sp. nov. ♂ (15), Fenestrae and hind claws of *E. laticarinatus*, sp. nov. ♀ (16, 17) and *E. relictus*, sp. nov. ♀ (18, 19).

posteriorly somewhat punctato-striate. Scutellum finely punctate, with a few transverse wrinkles near apex. Propodeum oblong, apical area with finely reticulated carinae; transverse ridge strong, almost straight.

Forewing 10 mm. long. Fenestra (Fig. 15) extending from basal 1/8 to apical 1/4 of 1st radial abscissa. Proximal sclerome hairy both above and below; distal sclerome sickle-shaped; quadra ill-defined. Radius with 1st abscissa basally thickened, weakly sinuate, about 7/8 as long as 2nd abscissa; transverse brace approximately 2:2.5:2.5 (24:30:30); 2nd recurrent and basal abscissa of discocubitus forming a narrow obtuse angle, the latter less than thrice as long as the former; 2nd discoidal cell broadest apicad to middle; nervulus interstitial. Superior and inferior nervellar abscissae about 18:8, the former and discoidella forming a right angle.

Abdominal segment I shorter than II, the former feebly curved, and with apical width subequal to trans-spiracular width. Tergum II with spiracles at apical 1/3, and gastrocoeli, basad to middle.

Testaceous, mandibular apices brownish.

Holotype ♂: Riu Kius, 1922 (J. SONAN).

This is a very distinct member of the *shinanus*-group with rugose propodeum. The most peculiar feature is the relative position of clypeus and labrum, and in allusion to this, the name "*iracundus*", angry, is here proposed.

Enicospilus laticarinatus, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity triangular, centrally deep. Labrum about 2/5 as long as malar space. Clypeus about 12 x 24, rather evenly convex, trans-tentorial furrow irrecognizable. Face very weakly punctate. Frontal tubercle obsolete. Antenna shorter than body; antenno-ocellar line: latero-ocellar line about 14:10. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 12:35.

Propleura very weakly, sparsely punctate, with a few striae near scrobes. Mesonotum shining; mesopleura (excluding superior corners) evenly, finely punctato-striate, with inferior areas distinctly striate; mesopleural cavity short, narrow and rather shallow. Metapleura with superior halves broadly, transversely carinate, inferior halves feebly micropunctate. Scutellum apically with 2 or 3 striae, laterally abruptly marked-off and with some transverse carinae. Propodeum oblong; apical area with numerous transverse carinae; transverse ridge moderately sharp, arcuate.

Forewing 18 mm. long. Fenestra (Fig. 16) extending from basal 1/3 to apical 1/4 of 1st radial abscissa. Proximal sclerome subtriangular, hairless both above and below; appendix linear, weakly sclerotized; quadra oblong, medium-sized; distal sclerome linear, gradually thickened toward apex. Radius with 1st abscissa weakly bisinuate, thickest at basal 2/3, and about 3/5 as long as 2nd abscissa; transverse brace about 2:3.6:2.4 (26:47:30); 2nd recurrent and basal abscissa of subdiscoideus forming a broad acute angle, the latter about 4 times as long as the former; nervulus

interstitial. Superior and inferior nervellar abscissae about 30:13, the former and discoidella forming a narrow obtuse angle. Hind claw as in Fig. 17.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles at apical 1/3; gastrocoeli, just basad to middle.

Testaceous. Mandibular apices, mesonotal stripes and veins brown; ocellar triangle black; abdomen beyond segment IV fuscous.

Holotype ♀ : Formosa, Takeyama, 6. I. 1928 (J. SONAN).

The present species is also a member of *shinkanus*-group, and can be recognized by the following combination of characters: broadly carinated metapleura, strongly recurved alar scleromes and long, slender tarsal claws. The specific name "*laticarinatus*" applies to the metapleural carinae.

Enicospilus relictus, sp. nov.

♀. Head distinctly narrowed behind eyes. Mandible strongly twisted; basal concavity poorly defined. Labrum about 1/2 as long as malar space. Clypeus about 14 x 25, evenly convex, weakly, sparsely punctate; trans-tentorial furrow narrow, ill-defined. Supraclypeal region moderately, sparsely punctate, sides of face subpolished. Frontal tubercle roundish, prominent. Antenna stout, shorter than body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 13:35.

Propleura moderately densely punctato-striate. Mesonotum finely punctate; mesopleura (excluding superior corners) moderately punctate, intermixed with fine, close punctato-striae; mesopleural cavity broad, rather shallow. Scutellum laterally sharply margined, basally finely punctate, and apical 3/4 with some distinct, longitudinal striae. Metapleura evenly punctate. Propodeum with apical area evenly, closely, irregularly wrinkled; transverse ridge strong, slightly curved.

Forewing 13 mm. long. Fenestra (Fig. 18) extending from basal 1/7 to apical 1/3 of 1st radial abscissa. Proximal sclerome subtriangular, hairless above and hairy below, anteriorly obliquely truncate; appendix obscure; quadra medium-sized, poorly outlined. Radius with 1st abscissa very weakly sinuate, slightly thickened at middle, and about 4/7 as long as 2nd abscissa; transverse brace about 2:3.2:2.2 (25: 40:28); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about thrice as long as the former; 2nd discoidal cell broadest slightly apicad to middle; nervulus antefurcal. Superior and inferior nervellar abscissae about 23:11, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 19.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width subequal to trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, basad to middle.

Testaceous. Mandibular apices and ovipositor dark brown to black; wings

hyaline.

Holotype ♀ : Formosa, Botel-Tobago, III-IV. 1932 (S. HIRAYAMA).

In general features, the present species appears to be closely related to *shinkanus*, but the propodeal sculpture is quite different. The specific name "*relictus*", abandoned, is given in allusion to the remnant distal sclerome.

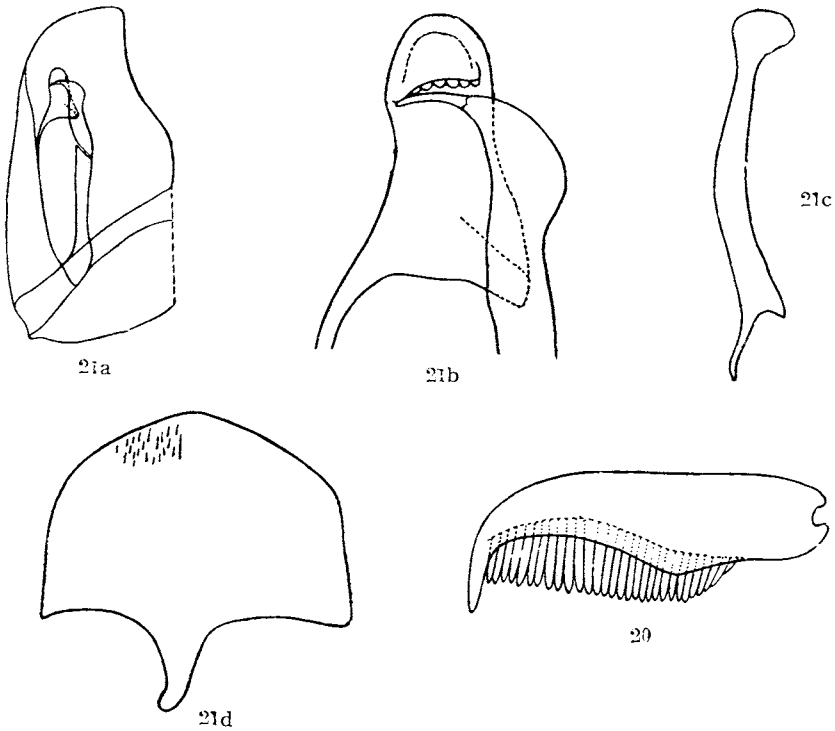
Enicospilus yonezawanus (UCHIDA)

1928 *Henicospilus yonezawanus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:218, pl. 7, fig. 6, ♀ ♂. (Japan: Honshu)

♂. Mandible exceedingly strongly twisted, basal concavity lunular. Labrum about 4/5 as long as malar space. Clypeus about 12 x 22, evenly convex; transtentorial furrow arcuate, sometimes irrecognizable. Frontal tubercle roundish, improminent. Antenno-ocellar line:latero-ocellar line about 10:12. Ocellar triangle raised. Greatest widths of temple and eye in profile about 11:30.

Mesopleural cavity broad, shallow, rather long. Scutellum narrow, moderately punctate, laterally sharply margined.

Forewing 11 mm. long. Fenestra extending from basal 1/5 to apical 1/4 of 1st radial abscissa. Proximal sclerome hairy both above and below; quadra large, ill-defined. Radius with 1st abscissa about 2/3 as long as 2nd abscissa; transverse



Figs. 20-21. *Enicospilus yonezawanus* (UCHIDA) ♂, hind claw (20) and male genitalia —21a. dorsal view of right-hand paramere (with volsella), 21b. right-hand volsella (more enlarged), 21c. right lateral plate of aedeagus, 21d. hypandrium.

brace about 2:3.8:3.3 (26:50:43); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about thrice as long as the former; nervulus antefurcal or interstitial. Superior and inferior nervellar abscissae about 23:11, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 20.

Abdominal segment I subequal in length to II, feebly curved in profile, apical width subequal to trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, basad to middle. Genitalia as in Fig. 21.

Formosa: Kuraru, 1♂; Kusukusu, 1♀; Shinten, 1♂.

Japan: Minomo, Osaka, 1♂.

Enicospilus maai, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity poorly defined. Labrum about 4/5 as long as malar space. Clypeus about 18 x 27; trans-tentorial furrow short, rather shallow, and indistinct at both ends. Face finely, feebly punctate; supraclypeal region with rather distinct lateral furrows. Antenna almost as long as body; antenno-ocellar line and latero-ocellar line subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 13:37.

Propleura polished, very sparsely, shallowly punctate. Mesonotum smooth; mesopleura strongly, broadly striate, but the basal 2/5 and extreme apical portion subpolished and the striae gradually weakened posteriorly; mesopleural cavity small, deep and rounded. Scutellum irregularly rugose, laterally sharply margined for the full length. Metapleura superiorly rugose, inferiorly finely punctate. Propodeum oblong; apical area with strong carinae, of which the median one apically obsolete, lateral ones oblique, few in number; transverse ridge sharp, smooth and curve.

Forewing 18 mm. long. Fenestra (Fig. 22) extending from base to nearly apex of 1st radial abscissa. Proximal sclerome subtriangular, hairless above and hairy below, anteriorly rounded; appendix long, apically recurved; quadra large, well defined. Radius with 1st abscissa almost straight, uniformly thickened, and about 3/5 as long as 2nd abscissa; transverse brace approximately 2:4:3 (25:50:38); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about 4 times as long as the former; 2nd discoidal cell broadest near apex; nervulus antefurcal. Superior and inferior nervellar abscissae about 37:12, the former and discoidella forming an obtuse angle.

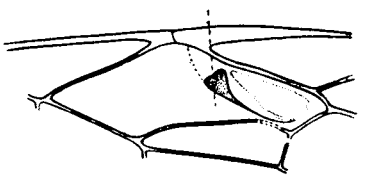


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Fig. 22. Fenestra of *Enicospilus maai*, sp. nov. ♀.

Abdominal segment I subequal in length to II, and nearly straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying

at apical 1/3; gastrocoeli, just basad to middle.

Testaceous. Mandibular apices, posterior half of mesonotum and tegulae blackish. Wings hyaline; subcosta basal vein and media dark brown; proximal sclerome, pterostigma and other veins fulvous; abdominal segment III and the following ones fuscous, with base of III and most part of IV paler.

Holotype ♀: Formosa, Musha, 1. I. 1929 (K. SATO).

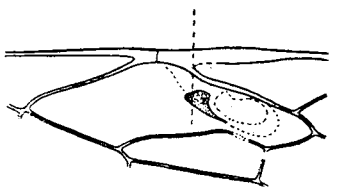
This species is named in honour of Prof. TSING-CHAO MAA, former y head of the Department of Economic Zoology, Taiwan Agricultural Research Institute, for his encouragement during the course of my study.

Enicospilus zyzzus, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity triangular. Labrum about 1/2 as long as malar space. Clypeus about 16 x 27, smooth and shining; anteriorly with a rather strong submarginal ridge, anterior marginal area gently reflexed; trans-tentorial furrow irrecognizable. Face polished, with very fine, scattered punctures. Frontal tubercle rounded, prominent. Antenna shorter than body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle somewhat prominent. Greatest widths of temple and eye in profile about 11:37.

Propleura subpolished, obscurely, finely striate. Mesonotum feebly granulated; mesopleura evenly, closely striate, but the superior corners almost smooth, and inferior moderately strongly striate; mesopleural cavity rather shallow. Scutellum with numerous strong, transverse rugae, laterally sharply edged. Metapleura with moderately strong transverse carinae. Propodeum ellipsoid; apical area with a few strong, widely separated, concentric carinae, those on basal 1/4 of the area running transversely; transverse ridge arcuate.

Forewing 17 mm. long. Fenestra (Fig. 23) extending nearly from base to apical 1/4 of 1st radial abscissa, which is basally slightly thickened. Proximal sclerome



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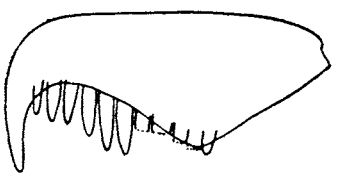

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Figs. 22-24. *Enicospilus zyzzus*, sp nov. ♀, fenestra (23), hind claw (24).

hairless above and hairy below, apically projecting out, but lacking appendix; quadra medium-sized, ovoid, well-defined; transverse brace approximately 2:3.8:2.7 (23:44:31); 2nd recurrent and basal abscissa of subdiscoideus almost forming a right angle, the latter about thrice as long as the former; 2nd discoidal cell broadest much apicad to middle; nervulus antefurcal. Superior and inferior

nervellar abscissae about 32:12, the former and discoidella forming almost a right angle. Hind claw as in Fig. 24.

Abdominal segment I subequal in length to II, weakly curved in profile. apical width subequal to trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, basad to middle.

Testaceous. Mandibular apices, mesonotal stripes, costa, pterostigma, most veins, abdomen beyond segment II (segmet III and IV ventrally flavo-testaceous) and ovipositor-sheath dark brown to black.

Holotype ♀: Fukien, Foochow, 13. II. 1948 (H. F. CHAO).

Paratype: Japan, Oshima, 1♀.

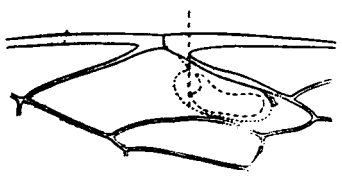
This remarkable species is to be very easily separated from its relatives by its zigzagged carinae on propodeum, reticulation on metapleura and striae on propleura. The name "*zyzzus*", zigzagged, applies to the propodeal carinae.

Enicospilus exaggeratus, sp. nov.

♀. Head distinctly narrowed behind eyes. Mandible slender, strongly twisted; basal concavity distinct and Y-shaped, with its median arm produced apicad to the furcation of the 2 teeth, of which the superior being much longer than inferior. Labrum about as long as malar space. Clypeus about 20 x 30, sparsely, finely punctate; anteriorly strongly convex, anterior marginal area gently deflexed, anterior submarginal ridge subtuberculate at middle; trans-tentorial furrow distinct, arcuate; supraclypeal region and sides of face with rather close, moderate-sized punctures. Frontal tubercle rounded, rather prominent. Antenna thick, nearly as long as body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised; median vertical furrow clearly defined. Greatest widths of temple and eye in profile about 16:40.

Propleura rugose, very weakly, sparsely punctate. Mesonotum shagreen; mesopleura (excluding superior corners) with very fine, dense, longitudinal punctato-striae, which gradually become broader, sparser and deeper towards posterior corners; mesopleural cavity very shallow. Metapleura smooth, with a few extremely deep, broad striae on superior halves. Scutellum broad, sparsely, finely punctate, laterally sharply margined for the full length. Transverse ridge sharp.

Forewing 21 mm. long. Fenestra (Fig. 25) extending nearly from base to



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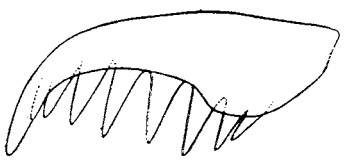

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Figs. 25-26. *Enicospilus exaggeratus*. sp. nov. ♀, fenestra (25), hind claw (26).

apical 1/10 of 1st radial abscissa. Proximal sclerome wanting; quadra large, well defined but weakly sclerotized; distal sclerome subtriangular. Radial cell basally with a hairless fenestra-like area; radius with 1st abscissa weakly sinuate, thickened near middle and about 2/3 as long as 2nd abscissa; transverse brace approximately 2:3.7:2.4 (35:65:42); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle, the latter about 4 times as long as the former; discocubitus weakly geniculate; nervulus antefurcal. Superior and inferior nervellar abscissae about 42:16, the former and discoidella forming an obtuse angle. Hind claw as in Fig 26.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli shallow, lying basad to middle.

Testaceous. Mandibular apices and lateral area of supraclypeal region darker; mesonotal stripes blackish; wings hyaline, pterostigma and veins dark brown, radial abscissa and abdomen beyond segment II partially black.

Holotype ♀: Formosa, Taiheizan, 10. V. 1942 (A. MUTUURA).

The double-fenestrate fore wing, exaggerated quadra, coarsely sculptured propodeum as well as very simple claw-dentation make this species never mistakable from any of its congeners. Its specific name "*exaggeratus*" refers to the quadra.

Enicospilus uniformis, sp. nov.

♀♂. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity poorly defined. Labrum as long as malar space. Clypeus very weakly, evenly convex, about 20 x 33; trans-tentorial furrow irrecognizable. Face densely, finely, punctate. Frontal tubercle oval, rather prominent. Antenna slightly shorter than body; antenno-ocellar line: latero-ocellar line about 10:15; ocellar triangle distinctly raised. Greatest widths of temple and eye in profile about 16:38.

Propleura moderately punctate, with a few punctato-striae near scrobes. Mesonotum finely punctate; mesopleura usually distinctly punctate, rarely finely punctato-striate; mesopleural cavity long, broad. Metapleura usually evenly densely punctate, very rarely the inferior area punctato-striate. Scutellum laterally sharply margined, with medium-sized punctures and many distinct longitudinal striae on the apical 1/3. Propodeum rounded; apical area irregularly, broadly rugoso-striate, the lateral striae more or less oblique, sometimes with a median carinae or median furrow, or rather regularly concentric carinae; transverse ridge strong, undulated.

Forewing 17 mm. long. Fenestra (Fig. 27) extending from nearly base to apical 1/5 of 1st radial abscissa. Proximal sclerome wanting; quadra small, well-defined, fusiform; distal sclerome also fusiform, much narrower than quadra

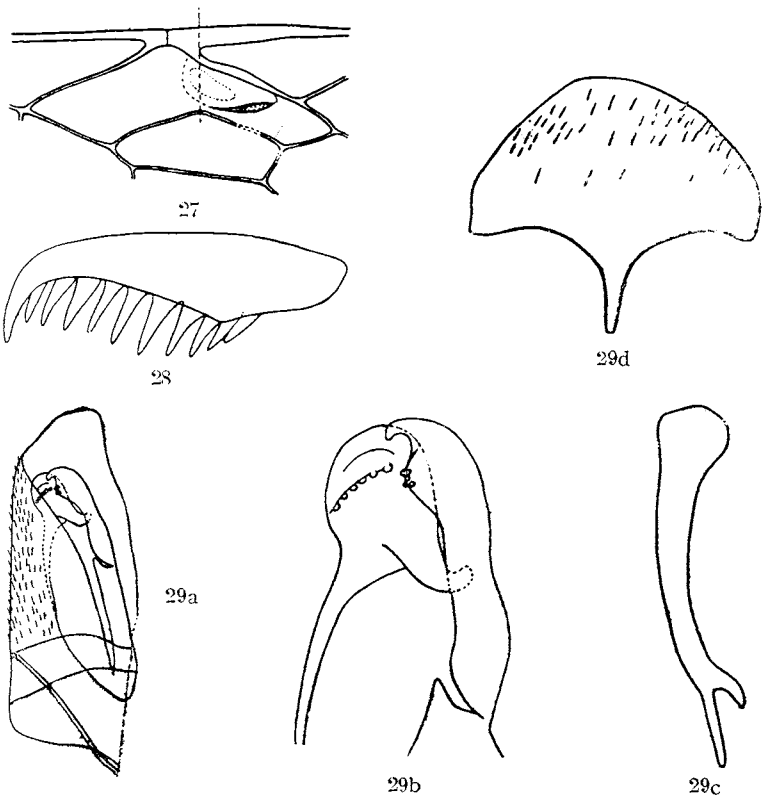
and with a long pale appendix extending proximally. Radius with 1st abscissa straight, thick, and about 3/5 as long as 2nd abscissa; transverse brace about 2:2.6:2.4 (33:43:39); 2nd recurrent and basal abscissa of subdiscoideus forming a narrowly obtuse angle, the latter about thrice as long as the former; discocubitus geniculate slightly apicad to middle, with or without a ramellus; nervulus distinctly antefurcal. Superior and inferior nervellar abscissae about 36: 12, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 28.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width usually subequal to trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocceli, slightly basad to middle. Genitalia as in Fig. 29.

Testaceous. Mandibular apices and costa brown, the 3 mesonotal stripes smoky.

Holotype ♀: Formosa, Taihoku, 14. IV. 1921 (S. Aoki).

Allotype ♂: Formosa, Taihoku, 5. IV. 1937 (J. Sonan).



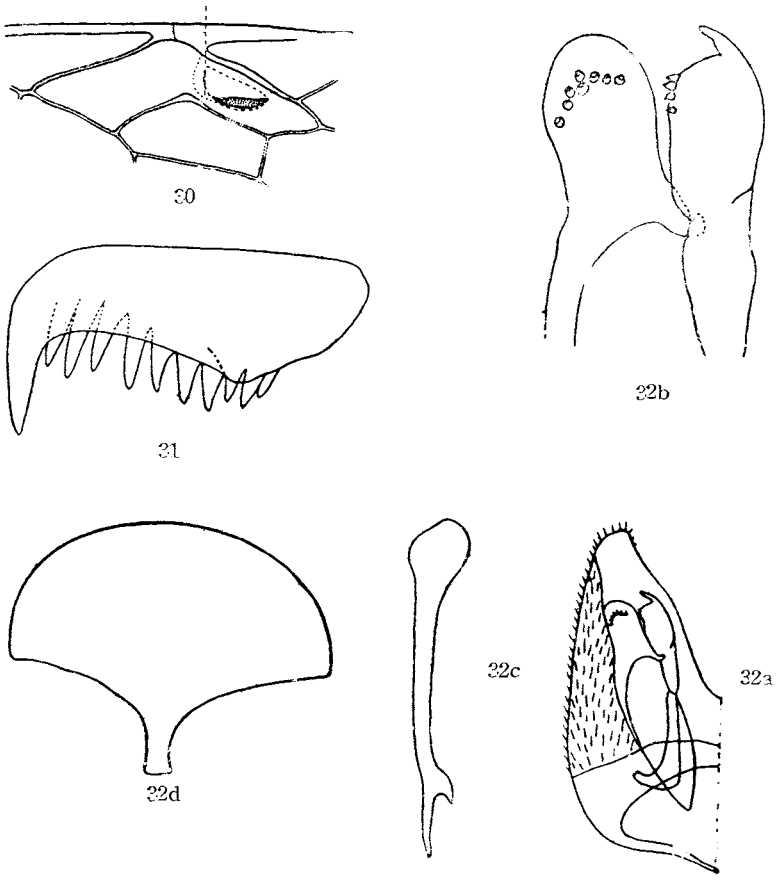
Figs. 27-29. *Enicospilus uniformis*, sp. nov. ♀, fenestra (27), hind claw (28) and male genitalia—29a. dorsal view of right-hand paramere (with volsella), 29b. right-hand volsella (more enlarged), 29c. right lateral plate of aedeagus, 29d. hypandrium.

Paratypes: Formosa, Arisan, 1♀; Botei-Tobago, 2♂♂; Chikunan, 1♀; Daiton, 1♀. Funkiko, 1♂; Hokuto, 3♀♀; Kagi, 2♀♀; Shinten, 1♀; Taihoku 38♀♀, 13♂♂; Taito, 2♀♀; Urai, 1♂. Japan, Kyoto, 1♀; Ueda, Nagano, 1♂.

Enicospilus fusiformis, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity poorly defined. Labrum as long as malar space. Clypeus about 20 x 40, rather coarsely, sparsely punctate; trans-tentorial furrow scarcely recognizable; sides of face finely, closely punctate; supraclypeal region striato-punctate. Frontal tubercle roundish, improminent. Antenna as long as body; antenno-ocellar line: latero-ocellar line about 12:15. Ocellar triangle raised. Greatest widths of temple and eye in profile about 11:55.

Propleura evenly, finely punctato-striate. Mesonotum shagreen, mesopleura



Figs. 30-32. *Enicospilus fusiformis*, sp. nov., fenestra ♀ (30), hind claw ♀ (31), male genitalia—32a. dorsal view of right-hand paramere (with volsella), 32b. right-hand volsella (more enlarged), 32c. right lateral plate of aedeagus, 32d. hypandrium.

densely punctato-striate, but superior corners moderately punctate; mesopleural cavity broad, curve, rather shallow. Metapleura punctate, intermixed with a few strong striae. Scutellum usually narrow (rarely broad), moderately sparsely punctate, intermixed with a few transverse carinae, laterally margined, and with apical 1/3 more or less striate. Propodeum ellipsoid; apical area moderately strongly carinate, laterally with oblique and at extreme apex with roundly curved carinae; transverse ridge strong, arcuate or slightly undulate.

Forewing 16 mm. long. Fenestra (Fig. 30) extending from nearly base to apical 1/4 of 1st radial abscissa. Proximal sclerome wanting; quadra small, well-defined; distal sclerome broad and fusiform, as in *uniformis*. Radius with 1st abscissa very thick, about 1/2 as long as 2nd abscissa; transverse brace approximately in the ratio 2:3.1:2.6 (28:44:37); 2nd recurrent and basal abscissa of subdiscoideus forming a broad acute angle, the latter less than thrice as long as the former; discocubitus abruptly thickened at a point basad to middle; nervulus antefurcal. Superior and inferior nervellar abscissae about 38:10, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 31.

Abdominal segment I subequal in length to II, feebly curved, apical width subequal to trans-spiracular width. Tergum II with spiracles lying just at apical 1/3; gastrocoeli, just at middle.

Testaceous. Mandibular apices, costa, pterostigma and metacarpus blackish, mesonotal stripes smoky.

♂. Essentially similar to female. Genitalia as in Fig. 32.

Holotype ♀: Formosa, Urai, 24. VI. 1933 (K. KOBAYASHI).

Allotype ♂: Formosa, Chipon, 20. III. 1943 (J. SONAN).

Paratypes: Formosa, Koshun, 1♂; Taihoku, 1♀, 1♂; Taito, 1♂.

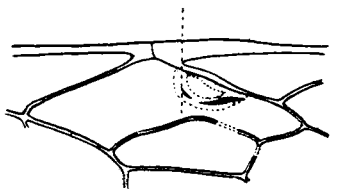
This and the preceding species are closely allied, and can be recognized from other Oriental representatives of the genus by the number, shape and site of the scleromes, in combination with the general features of clypeus, mandibles, temples, propodeum and basal abdominal tergum. The specific names "*uniformis*" and "*fusiformis*", respectively, refer to the discocubitus and distal sclerome. For the difference of these 2 species, reference may be made to the synopsis (couplet 8) as well as the foregoing descriptions and accompanying figures.

Enicospilus flatus, sp. nov.

♀. Head in dorsal aspect narrowed behind eyes, and with a very distinct constriction at each side between eye and temple. Mandibles strongly twisted; basal concavity flattened but rather distinct. Labrum about 7/10 as long as malar space. Clypeus about 15 x 35, evenly convex; trans-tentorial furrow scarcely recognizable. Face finely punctate, with a wide, exceptionally deep depression

between either antennal insertion and its nearest inner orbit. Frontal tubercle ovoid, very weakly developed, discally dimpled. Antenna slender, nearly as long as body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle rather prominent. Temple swollen in profile, about 17:35 as wide as eye.

Propleura with fine striae, which become broader and stronger near scrobes. Mesonotum finely punctate; mesopleura evenly adorned with medium-sized punctures; mesopleural cavity moderately long and deep. Scutellum moderately punctate, laterally sharply margined. Propodeum rounded; apical area with irregular, rather strong, mostly oblique or arcuate carinae, the basal ones being, however, short and longitudinal; transverse ridge rather distinct.



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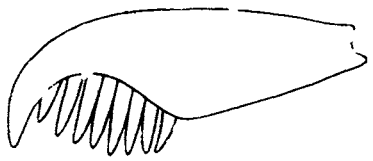

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Figs. 33-34. *Enicospilus flatus*, sp. nov. ♀, fenestra (33), hind claw (34).

Forewing 15 mm. long. Fenestra (Fig. 33) extending from basal point to apical 1/3 of 1st radial abscissa. Proximal sclerome linear, poorly developed; distal sclerome narrow, elongate, broadened at middle, slightly sinuous, and hairless both above and below. Radius with 1st abscissa sinuate, thickened at base, gradually tapering off toward apex; transverse brace about in the ratio 2:2.6:2.1 (30:40:32); 2nd recurrent and basal abscissa of subdiscoideus forming a distinct obtuse angle, the latter about thrice as long as the former; 2nd discoidal cell broadest just apicad to middle; nervulus interstitial. Superior and inferior nervellar abscissae about 36:12, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 34.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, far basad to middle.

Testaceous. Mandibular apices dark brown. Mesonotal stripes paler. Wings hyaline, scleromes as well as pterostigma testaceous; costa and basal veins brown.

Holotype ♀: Formosa, Taihoku, 28. V. 1931 (J. SONAN).

The present species stands quite near *E. uniformis* m., but the presence of a remnant proximal sclerome makes it readily distinguishable. Its antennae are a little shorter, and 1st radial abscissa a little thinner than in the latter species. The name "*flatus*", a breeze, is here proposed in allusion to the general features of the scleromes.

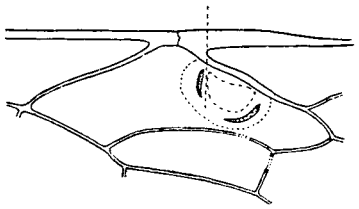
Enicospilus pundibundae (UCHIDA)

1923 *Henicospilus pundibundae* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:219, pl. 7, fig 4, ♀ ♂ (Japan: Hokkaido, Honshu; Korea: Onseiri).

♀ ♂. Mandible strongly twisted; basal concavity shallow, triangular. Labrum about 2/3 as long as malar space. Clypeus about 22 x 35, evenly convex. Transtentorial furrow poorly defined. Frontal tubercle oblong, prominent. Antennoocellar line: latero-ocellar line about 10:14. Ocellar triangle very slightly raised. Greatest widths of temple and eye in profile about 18:42.

Mesonotum usually with 3 brownish stripes; mesopleural cavity oblong and moderately shallow.

Forewing 22 mm. long. Fenestra (Fig. 35) short, broad, extending from base



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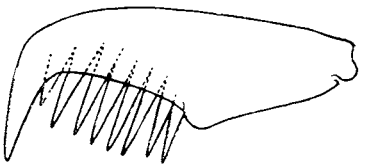

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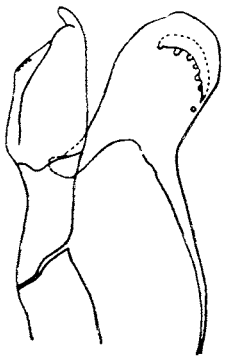

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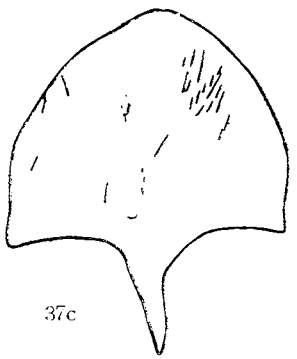


37c

Figs. 35-37. *Enicospilus punbibundae* (UCHIDA), fenestra ♀ (35), hind claw ♀ (36), and male genitalia—37a. right lateral plate of aedeagus, 37b. left-hand volsella, 37c. hypandrium.

to apical 1/3 of 1st radial abscissa. Radius with 1st abscissa about 1/2 as long as 2nd abscissa. Proximal sclerome longish, hairless both above and below; distal sclerome weakly sclerotized, simiarly shaped as proximal sclerome; quadra very large; transverse brace approximately in the ratio 2:3.3:2.4(35:58:42); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about thrice as long as the former; nervulus antefurcal. Superior and inferior nervellar abscissae about 45:18, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 36.

Abdominal segment I subequal in length to II, feebly curved in profile, apical

width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli basad to middle. Genitalia as in Fig. 37.

Japan: Gifu, 1♀; Jyokoji, 1♀; Nagano, 1♀; Rono, 1♂.

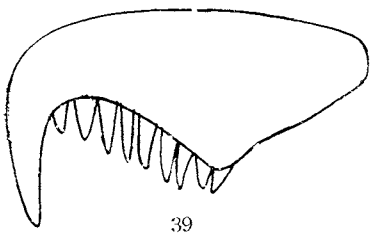
Enicospilus triguttatus (UCHIDA)

1928 *Henicospilus triguttatus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ. 21:221, pl. 5, fig. 5, ♀. (Formosa: Horisha).

The following is a supplement to the description by UCHIDA.

♀. Mandible exceedingly strongly twisted; basal concavity triangular. Labrum about 6/7 as long as malar space. Clypeus about 20 x 32. Trans-tentorial furrow scarcely recognizable. Antenno-ocellar line:latero-ocellar line about 20:16. Ocellar triangle raised. Greatest widths of temple and eye in profile about 13:45. Mesopleural cavity short and narrow, gradually deepened posteriorly.

Forewing 22 mm. long. Fenestra (Fig. 38) small, extending from base to apical



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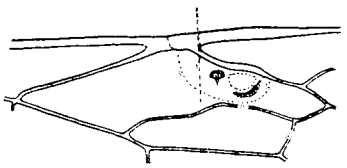

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Figs. 38-39. *Enicospilus triguttatus* (UCHIDA) ♀, fenestra (38), hind claw (39).

1/3 of 1st radial abscissa. Proximal sclerome wanting; central sclerome roundish, very heavily sclerotized, hairless both above and below, with a short appendix; quadra small, ill-defined; distal sclerome narrowly lunate; transverse brace approximately in the ratio 2:2.1:2.3(40:43:46); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle, the latter about 4 times as long as the former; nervulus interstitial. Superior and inferior nervellar abscissae about 48:15, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 39.

Abdominal segment I shorter than II, curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying basad to apical 1/3 and gastrocoeli basad to middle.

Formosa: Horisha, 1. XI. 1931 (J. SONAN), 1♀.

Enicospilus striatus CAMERON

1899 *Enicospilus striatus* CAMERON, Manch. Mem. p. 103. (♀♂) (Khasia hills).

1913 *Henicospilus striatus* MORLEY, Faun. Brit. Ind. Hym., 3:393, ♀♂. (Assam; Bhutan; China; Singapore; Sarawak).

1937 *Enicospilus nigrimarginalis* CUSHMAN, Arb. morph. tax. Ent. Berl.-Dahl. 4:311, ♂. (Formosa: Taihorin) (syn. nov.)

♂♀. Mandible strongly twisted; basal concavity poorly defined. Labrum about

4/5 as long as malar space. Clypeus about 15 x 28, evenly convex; trans-tentorial furrow scarcely recognizable. Frontal tubercle prominent. Antenno-ocellar line: latero-ocellar line about 12:15. Ocellar triangle distinctly raised. Greatest widths of temple and eye in profile about 15:32. Superior and inferior nervellar abscissae about 33:11; the former and discoidella forming an obtuse angle. Fenestra and hind claw as in Figs. 41 and 42 respectively. Abdominal segment I longer than II, with apical width subequal to trans-spiracular width. Genitalia as in Fig. 40.

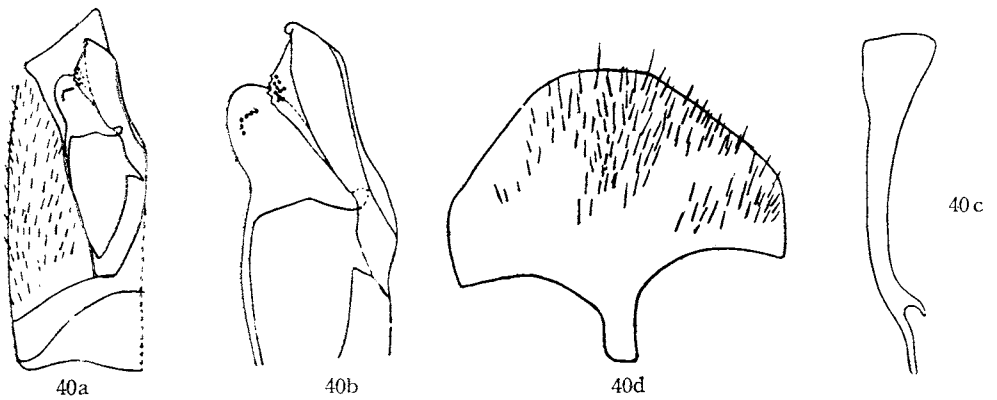


Fig. 40(a-d). Male genitalia of *Enicospilus striatus* CAMERON—40a. dorsal view of right-hand paramere (with volsella), 40b. right-hand volsella (more enlarged), 40c. right lateral plate af aedeagus, 40d. hypandrium.

Formosa: Arisan, 2♀♀; Bozan, 1♂; Mt. Daiton, 1♀; Kagi, 2♂♂; Kappanzan, 1♀; Karenko, 1♂; Kilim, 2♂♂; Nanto, 1♀; Sozan, 1♀; Suisha, 2♀♀; Taihoku, 17♂♂, 23♀♀; Tainan, 1♀; Urai, 1♂.

Fukien: Chyuanchow, 1♀.

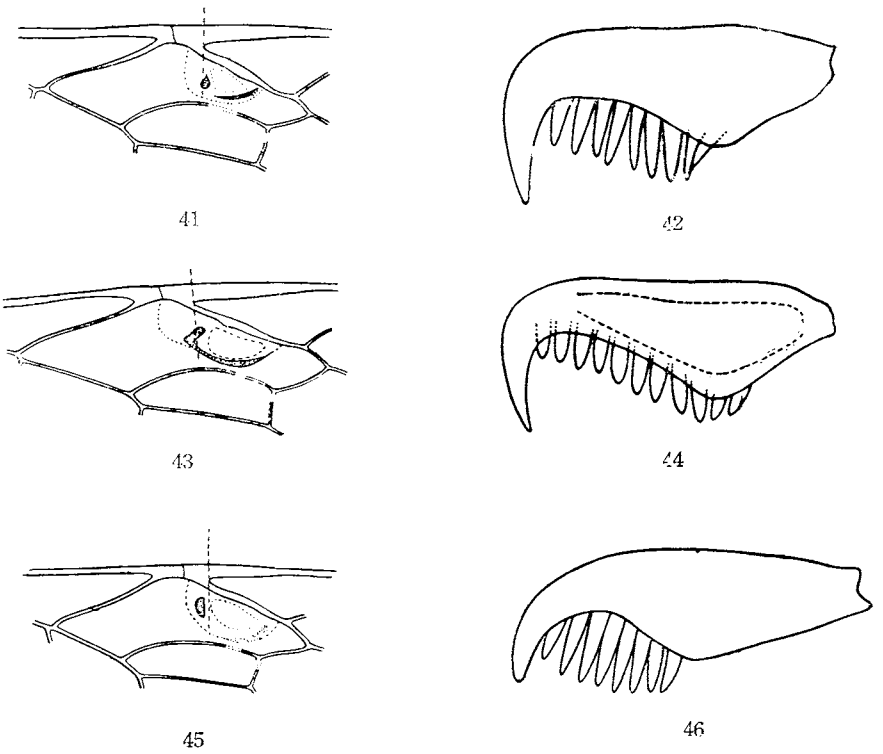
Riu Kius: 1♀.

Enicospilus gephyrus, sp. nov.

♀. Head distinctly narrowed behind eyes. Mandible strongly twisted; basal concavity large, triangular. Labrum about 4/5 as long as malar space. Clypeus about 15 x 30, rather smooth and shining; anterior submarginal ridge poorly defined; trans-tentorial furrow irrecognizable; supraclypeal region moderately striato-punctate; sides of face sparsely punctate. Frontal tubercle roundish, rather prominent. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 13:35.

Propleura finely striato-punctate, with a few striae near scrobes. Mesonotum granulated; mesopleura thoroughly with fine, longitudinal striation; mesopleural cavity rather shallow. Scutellum sharply margined at sides, moderately punctate except for the apical half which is coarsely, longitudinally striate. Metapleura with a few coarse, irregular rugae. Propodeum roundish; apical area with a median

and numerous lateral carinae, the latter being oblique, rather strong and regularly arranged; transverse ridge weakly undulated.



Figs. 41-46. Fenestrae and hind claws of *Enicospilus striatus* CAMERON ♀. (41, 42), *E. gephyrus*, sp. nov. ♀. (43, 44), and *E. tenuinubeculus*, sp. nov. ♀ (45, 46).

Forewing 16 mm. long. Fenestra (Fig. 43) extending from base to apical 1/4 of 1st radial abscissa. Proximal sclerome elbowed, hairless both above and below; appendix short and connected with the sickle-formed distal sclerome. Radius with 1st abscissa straight, basal 2/5 thickened, about 3/5 as long as 2nd abscissa; transverse brace about 2:2.4:1.3(44:56:30); 2nd recurrent and basal abscissa of subdiscoideus almost perpendicular to each other, the latter about thrice as long as the former; 2nd discoidal cell broadest near middle; nervulus postfurcal. Superior and inferior nervellar abscissae about 35:17, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 44.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, immediately basad to middle.

Testaceous. Mandibular apices and mesonotal stripes black. Wings hyaline, anterior end of proximal sclerome brown, slightly paler toward base; pterostigma, costa and basal veins dark brown, other veins brown.

Holotype ♀ : Japan, Tokusa, Yamaguchi, 1. VIII. 1922 (T. SHIRAKI).

This is also a member of *striatus*-group, and can be recognized by the following combination of characters: elbowed proximal sclerome, oblique carinae on propodeum and strongly decurved tarsal claw (as in Fig. 44).

Enicospilus tenuinubeculus, sp. nov.

♀. Head shining, strongly narrowed behind eyes. Mandible strongly twisted; basal concavity triangular. Labrum about as long as malar space. Clypeus about 20 x 28, evenly convex, weakly, sparsely punctate; trans-tentorial furrow scarcely recognizable. Supraclypeal region and sides of face deeply, finely punctate. Frontal tubercle rounded, raised. Antenna (?); antenno-ocellar and latero-ocellar lines about 10: 13. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 15:35.

Propleura punctate, with a few fine striae near scrobes. Mesonotum granulated; meso- and metapleura densely, finely punctate; mesopleural cavity broad, shallow and moderately long. Scutellum elevated, sparsely, moderately punctate and laterally sharply margined. Propodeum rounded, basal area rather short; apical area basally weakly verrucose, while the apical 2/3 with more regularly arranged, strongly arcuate carinae; transverse ridge moderately strong and weakly undulated.

Forewing 18 mm. long. Fenestra (Fig. 45) extending from base to apical 1/4 of 1st radial abscissa. Proximal sclerome ellipsoid, shorter than high, hairless both above and below; quadra medium-sized, nearly semicircular; 1st radial abscissa weakly sinuate, rather thick, but the apical 1/6 strongly tapering off toward apex; transverse brace approximately 2:3.4:2.2(32:55:36); 2nd recurrent and basal abscissa of subdiscoideus forming a narrow obtuse angle, the latter about thrice as long as the former; nervulus antefurcal. Superior and inferior nervellar abscissae about 36: 14, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 46.

Abdominal segment I subequal in length to II, and weakly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles at apical 1/3; gastrocoeli, basad to middle.

Testaceous. Mandibular apices dark brown; costa and most veins brown; dorsal ridge and lateral sides of tergum IV and of the following ones more or less brownish.

Holotype ♀: Fukien, Shaowu, 23-29. V. 1944 (H. F. CHAO).

A member of *striatus*-group. The most distinctive character of the present species seems to be the long, distinct and slender quadra of fore wing, upon which the name "*tenuinubeculus*" is based. The shape and dentation of the tarsal claws are also very characteristic.

Enicospilus ramidulus (LINN.)

1758 *Ichneumon ramidulus* LINNE, Syst. nat. (Ed. 10), 1:566.
1798 *Ophion ramidulus* FABRICIUS, Suppl. entom. syst., p. 236.

1829 *Ophion ramidulus* GRAVENHORST, Ichn. Eur., 3:699, ♀ ♂.
1903 *Enicospilus ramidulus* SCHMIEDEKNECHT, Opusc. Ichn., 4:1434.
1928 *Henicospilus ramidulus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:225, ♀ ♂. (Japan: Saghalin, Kuriles, Hokkaido, Honshu; Korea).

♀ ♂. Mandible exceedingly strongly twisted; basal concavity lunular, rather deep. Labrum about 4/5 as long as malar space. Clypeus about 15 x 27, moderately convex; trans-tentorial furrow irrecognizable. Supraclypeal region and sides of face much more densely punctate than clypeus. Frontal tubercle roundish, prominent. Antenno-ocellar line: latero-ocellar line about 12:15. Ocellar triangle rather raised. Greatest widths of temple and eye in profile about 15:27.

Mesonotum subpolished, moderately punctate; mesopleural cavity oblong, shallow, laterally sharply margined, with a few striae on apical 1/3. Propodeum rounded; apical area with numerous fine, dense, rather weak carinae; transverse ridge moderately strong, arcuate.

Forewing 14.5 mm. long. Fenestra (Fig. 48) small, extending from basal 1/8 to 1/4 of 1st radial abscissa; proximal sclerome hairy both above and below; quadra small; central sclerome roundish. Radius with 1st abscissa thickened near base, about 2/3 as long as 2nd abscissa; transverse brace approximately in the ratio 2:3.5:3(20:35:30); 2nd recurrent and basal abscissa of subdiscoideus forming a broad acute angle, the latter less than thrice as long as the former; 2nd discoidal cell broadest much apicad to middle; nervulus interstitial or slightly antefurcal. Superior and inferior nervellar abscissae about 25:15, the former and discoidella forming about a right angle. Hind claw as in Fig. 49. Abdominal segment I subequal in length to II, slightly curved in profile, apical width greater than transspiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle. Genitalia as in Fig. 47.

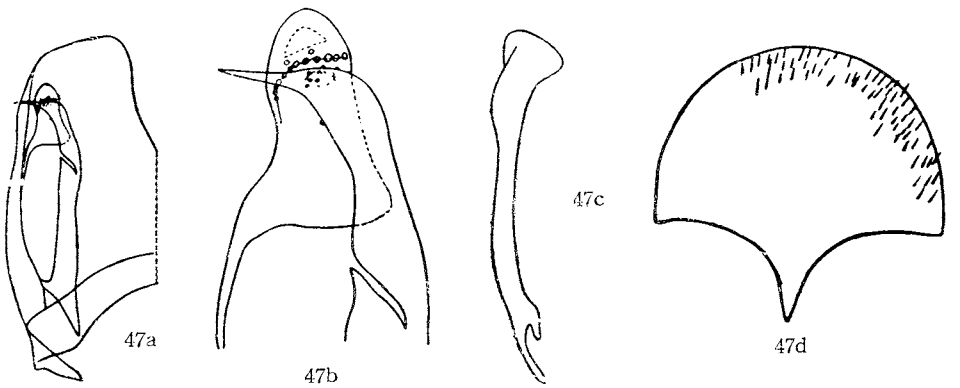


Fig. 47(a-b). Male genitalia of *Enicospilus ramidulus* (LINN.) 47a. dorsal view of right-hand paramere (with volsella), 47b. right-hand volsella (more enlarged), 47c. right lateral plate of aedeagus, 47d. hypandrium.

Testaceous. Mandibular apices brownish; abdominal segment V (apically) and following ones including ovipositor sheath dark brown to black.

Korea: Koryo, Hosen, Keikido, 1♀, 1♂.
Japan: Kyoto, 2♀♀.

Enicospilus ranunculus, sp. nov.

♀. Head slightly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity lunular, rather deep. Labrum about 2/3 as long as malar space. Clypeus about 15 x 25, distinctly punctate, moderately convex; anterior submarginal ridge subtuberculate at middle; trans-tentorial furrow irrecognizable; supraclypeal region and sides of face much more densely and deeply punctate than the clypeus. Frontal tubercle conical, prominent. Antenna shorter than body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 15:25.

Propleura subpolished, feebly, sparsely punctate. Mesonotum finely, densely punctate; mesopleura with evenly distributed, moderately sparse punctures which become finer and denser on superior areas; mesopleural cavity obscure. Scutellum subpolished, with fine, sparse punctures, laterally sharply margined. Propodeum roundish; apical area with numerous dense, irregularly arranged carinae; transverse ridge weak, arcuate.

Forewing 11mm. long. Fenestra (Fig. 50 extending from base to apical 1/3 of 1st radial abscissa. Proximal sclerome hairy both above and below; quadra small; central sclerome small, tadpole-like. Radius with 1st abscissa basally strongly thickened, about 5/8 as long as 2nd abscissa; transverse brace approximately 2:5:4 (15:40:28); 2nd recurrent and basal abscissa of subdiscoideus forming a broad acute angle, the latter less than thrice as long as the former; nervulus postfurcal. Superior and inferior nervellar abscissae about 13:25, the former and discoidella forming nearly a right angle. Hind claw as in Fig. 51.

Abdominal segment I slightly longer than II, nearly straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

Testaceous. Mandibular apices and costa brownish; abdomen excluding first 5 segments dark brown to black.

Holotype ♀: Korea, Kôngo-San, Kôgen-dô, 7. IX. 1931 (C. TAKEYA).

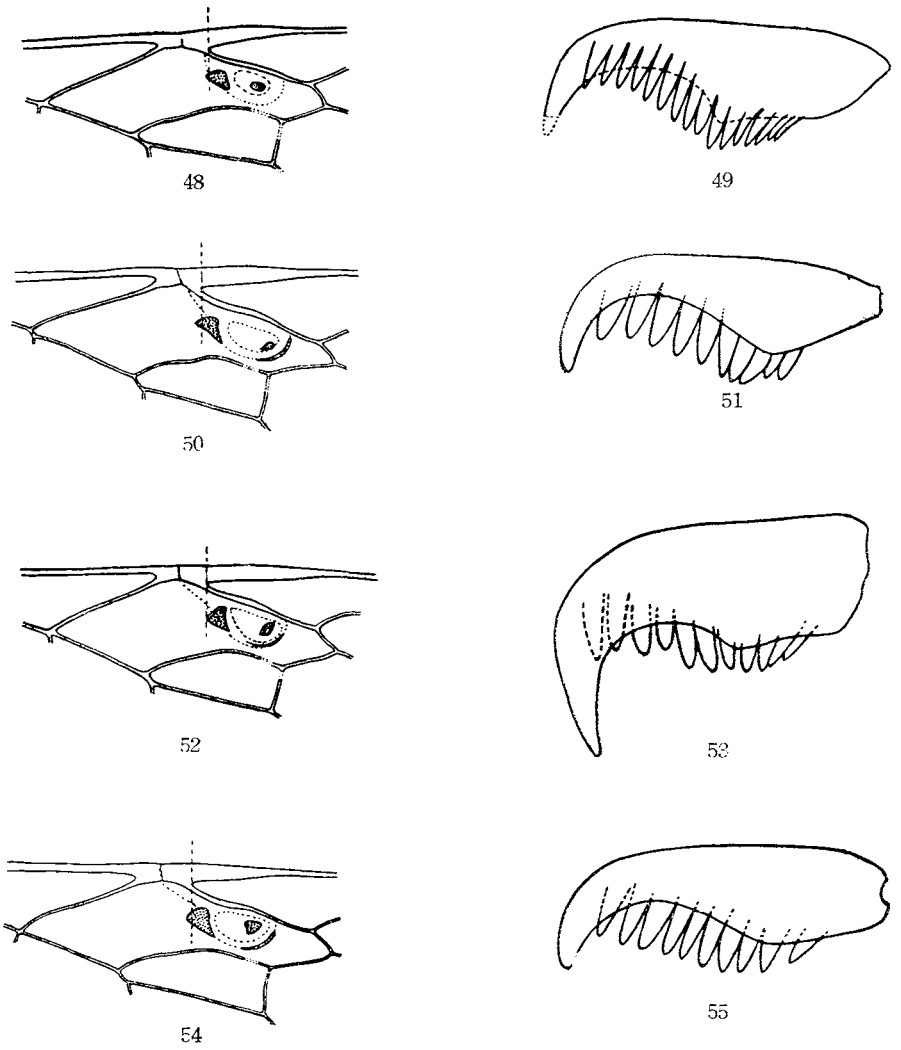
This species is a member of *ramidulus*-group, and can be easily distinguished by the tadpole-like central sclerome, for which the name "*ranunculus*" is given. So far as the tarsal claws are concerned, it stands closest to *E. leetoni* m., which belongs to the same group.

Enicospilus tripartitus, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity deep, lunular. Labrum about 5/7 as long as malar space. Clypeus

about 12 x 24, evenly convex; trans-tentorial furrow irrecognizable; supraclypeal region more coarsely punctate than sides of face and particulariy clypeus. Frontal tubercle linear, poorly developed. Antenna shorter than body; antenno-ocellar line:latero-ocellar line about 6:10. Ocellar triangle rather prominent. Greatest widths of temple and eye in profile about 12:28.

Propleura for the most part with fine punctato-striae. Mesonotum granulated; mesopleura superiorly striato-punctate and inferiorly punctato-striate; mesopleural cavity broad, rather shallow. Metapleura moderately punctate. Scutellum evenly punctate, rarely intermixed with striae, laterally sharply margined. Propodeum



Figs. 48-55. Fenestrae and hind claws of *Enicospilus ramidulus*(LINN.) ♀ (48, 49), *E. ranunculus*, sp. nov. ♀ (50, 51), *E. tripartitus*, sp. nov. ♀ (52, 53), and *E. leetoni*, sp. nov. ♂ (54, 55)

roundish; apical area with numerous fine, sinuous carinae, which tend to become oblique ones towards lateral margins; transverse ridge well developed.

Forewing 10 mm. long. Fenestra (Fig. 52) extending from base to apical 1/4 of 1st radial abscissa. Proximal sclerome hairy both above and below; appendix wanting; quadra ill-defined; central sclerome shorter than high, situated at apical portion of quadra; distal sclerome short, weakly sclerotized, lying near the apico-anal corner of fenestra. Radius with 1st abscissa thickened near base, about 5/9 as long as 2nd abscissa; veins of transverse brace approximately 2:4:4(17:32:30); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter less than thrice as long as the former; 2nd discoidal cell broadest immediately apicad to middle and strongly narrowed toward base; nervulus interstitial or antefurcal. Superior and inferior nervellar abscissae about 20:12, the former and discoidella forming a right angle. Hind claw as in Fig. 53.

Abdominal segment I subequal in length to II, rather curved in profile, apical width subequal to, or, rarely smaller than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

Testaceous. Mandibular apices brown; ovipositor-sheath dark brown.

Holotype ♀: Formosa, Taihoku, 27 VIII. 1937 (J. SONAN).

Paratypes: Formosa, Taihoku, 1♀; Kusukusu, 1♀. Fukien, Shaowu (Ta-Chu-Lan) 1♀. Riu Kiu, Nago, 1♀. Korea, Suigen, 2♀♀. Japan, Obira, Kyushu, 1♀. Lacking locality label, 1♂.

The name "*tripartitus*" refers to the scutellum and metanotum, which combinedly form a 3-stepped ladder-like structure.

Enicospilus leetoni, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity half-moon shaped. Labrum about 5/8 as long as malar space. Clypeus about 12 x 24, evenly convex; trans-tentorial furrow irrecognizable. Supra-clypeal region and sides of face much more densely and deeply punctate than clypeus. Frontal tubercle roundish, prominent. Antenna shorter than body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle rather raised. Greatest widths of temple and eye in profile about 10:32.

Propleura punctate, more or less punctato-striate near scrobes. Mesonotum finely punctate; mesopleura finely, densely striato-punctate, inferiorly with numerous distinct, fine and very close striae; mesopleural concavity long and shallow. Metapleura for the most part with fine transverse carinae. Scutellum narrow, evenly, finely punctate, laterally sharply margined. Propodeum oblong, apical area with numerous moderately strong, broad carinae, which are somewhat longitudinal at base and extreme apex; transverse ridge strong.

Forewing 13 mm. long. Fenestra (Fig. 54) extending from basal 1/4 to apical

1/3 of 1st radial abscissa. Proximal sclerome hairless above and hairy below; quadra medium-sized. Radius with 1st abscissa basally slightly thickened, about 2/3 as long as 2nd abscissa; transverse brace approximately in the ratio 2:4.6:3.3 (18: 42:30): 2nd recurrent and basal abscissa of subdiscoideus forming a broad acute angle, the latter about thrice as long as the former; nervulus interstitial. Superior and inferior nervellar abscissae about 25:9, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 55.

Abdominal segment I subequal in length to II, feebly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

Testaceous, mandibular apices and most veins brown.

♂. Similar to female, but propodeal carinae finer, apical and trans-spiracular widths of abdominal segment I subequal, hind claws bearing more teeth. Genitalia as in Fig. 56.

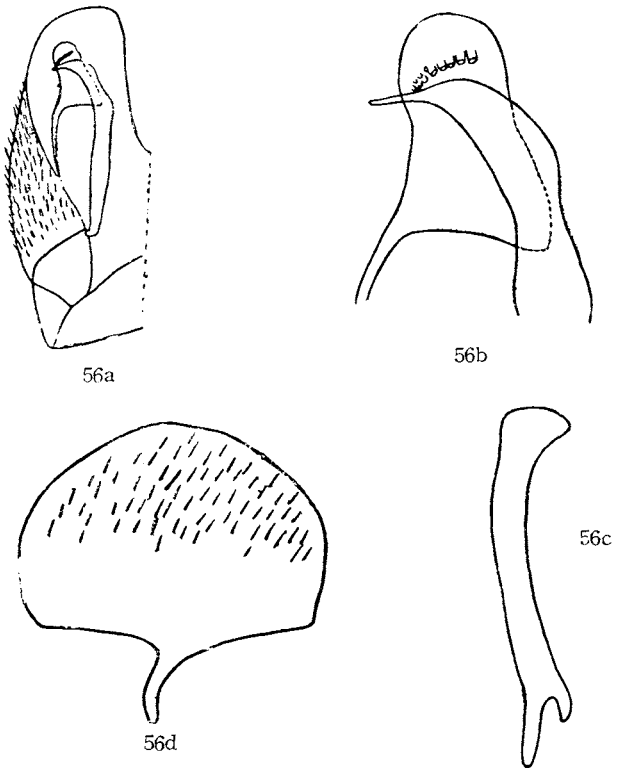


Fig. 56 (a-d). Male genitalia of *Enicospilus lectoni*, sp. nov.—56a. dorsal view of right-hand paramere (with volsella), 56b. right-hand volsella (more enlarged), 56c. right lateral plate of aedeagus, 56d. hypandrium.

Holotype ♀ : Formosa, Taihoku, 1. IX. 1925 (J. SONAN).

Allotype ♂ : Formosa, Koshun, 15–16. XI. 1947.

Named after Mr. LEETON CHEN. This species bears some affinities to *E. tripartitus* m., and differs from the latter, besides the central sclerome, metanotum and propodeum, in the structure of tarsal claws and male genitalia.

Enicospilus receptor, sp. nov.

♀. Head distinctly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity triangular, acute-angled, and distinctly, finely punctate. Labrum about 5/6 as long as malar space. Clypeus about 18 x 30, evenly convex, subpolished; trans-tentorial furrow short, broad, and shallow. Face finely, sparsely punctate. Frontal tubercle oval, rather prominent. Antenna shorter than body; antenno-ocellar and latero-ocellar lines subequal. Greatest widths of temple and eye in profile about 15:37.

Propleura coarsely punctate, interfused with a few striae near scrobes. Mesonotum polished; mesopleura superiorly moderately punctate, inferiorly with numerous fine striae; mesopleural cavity shallow. Metapleura in the main finely punctate. Scutellum weakly punctate, laterally sharply margined, apical 1/3 with a few distinct striae. Propodeum oblong, irregularly, broadly and rather distinctly carinate; transverse ridge strong, arcuate.

Forewing 18 mm. long. Fenestra (Fig. 57) extending from nearly base to apical 1/5 of 1st radial abscissa. Proximal sclerome hairy both above and below; appendix linear; quadra small, well-defined; central sclerome occupying almost apical half of quadra. Radius with 1st abscissa thickest at a point immediately basad to middle; about 1/2 as long as 2nd abscissa; transverse brace approximately in the ratio 2:3:2 (27:42:28); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle, the latter about 4 times as long as the former; 2nd discoidal cell rather long, broadest apicad to middle; nervulus distinctly antefurcal. Superior and inferior nervellar abscissae about 36:15, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 58.

Abdominal segment I subequal in length to II, almost straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

Testaceous. Mandibular apices, costa, pterostigma, and most veins brown to dark brown.

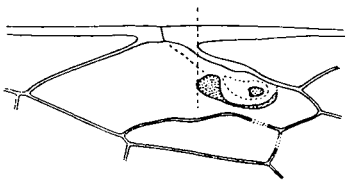
Holotype ♀: Formosa, Koshun, 27. XI. 1923 (R. TAKAHASHI).

Further specimen: Formosa, Taihoku, 1 ex. (♀ or ♂?)

The most noticeable character of this species is the structure of scutellum as well as metanotum, which seems unique among the members of this extensive genus. The tarsal claws are also distinctive.

Enicospilus glabrifacies, sp. nov.

♂. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted;



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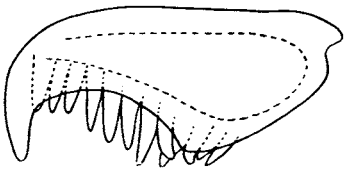

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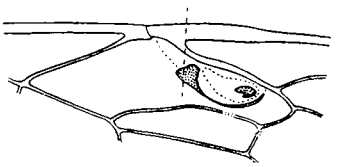

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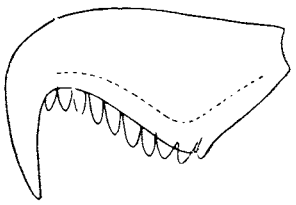

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Figs. 57-60. Fenestrae and hind claws of *Enicospilus receptor*, sp. nov. ♀ (57, 58), *E. glabrifacies*, sp. nov. ♂ (59, 60).

basal concavity triangular. Labrum about 1/2 as long as malar space. Clypeus about 18 x 25, evenly convex; trans-tentorial furrow irrecognizable; face obscurely punctate. Frontal tubercle oval, slightly prominent. Antenna (?); antenno-ocellar line: latero-ocellar line about 10:12. Ocellar triangle raised. Greatest widths of temple and eye in profile about 10:33.

Propleura finely striate. Mesonotum subpolished; mesopleura punctato-striate; mesopleural cavity broad, shallow. Scutellum scarcely punctate, laterally sharply margined. Propodeum oblong; apical area with a strong median and a few oblique lateral carinae; transverse ridge moderately strong.

Forewing 9 mm. long. Fenestra (Fig. 59) extending from basal 1/4 to apical 1/5 of 1st radial abscissa. Proximal sclerome hairless above and hairy below; appendix long, linear, weakly sclerotized; quadra oblong, well-defined, apically with a kidney-shaped central sclerome. Radius with 1st abscissa thickest near middle, about 3/5 as long as 2nd abscissa; transverse brace approximately in the ratio 2:3:2 (25:38:26); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle, the latter more than 4 times as long as the former; 2nd discoidal cell long and narrow; nervulus antefurcal. Superior and inferior nervellar abscissae about 33:11. the former and discoidella forming an obtuse angle. Hind claw as in Fig. 60.

Abdominal segment I subequal in length to II, weakly curve in profile, apical width greater than trans-spiracular width. Tergum II with spiracles at apical 1/3 and gastrocoeli, basad to middle.

Testaceous. Mandibular apices, antenna (basally), costa, pterostigma and subcostella brown to dark brown.

Holotype ♂: Formosa, Kuraru, 1. VIII. 1931 (T. SHIRAKI).

This is also a member of *ramidulus*-group and can be easily recognized from its relatives by the glabrous face as well as peculiarly-shaped tarsal claws.

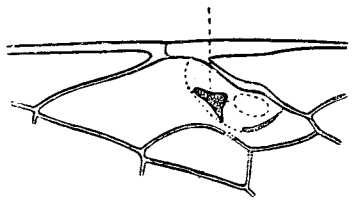
Enicospilus isshikii (UCHIDA)

1928 *Dicamptus isshikii* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:212, pl. 7, fig. 8, ♀. (Japan: Honshu).

The following notes are to be supplementary to the original description.

♀. Mandible gradually twisted; basal concavity lunular. Labrum about 1/2 as long as malar space. Clypeus about 20 x 10, anterior marginal area deflexed; strongly convex; trans-tentorial furrow arcuate, broad and deep but with both ends indistinct. Face with a narrow, rather deep depression between either antennal insertion and its nearest inner orbit. Frontal tubercle linear, prominent. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Median vertical furrow shallow. Greatest widths of temple and eye in profile about 10:28.

Propleura very finely punctate and intermixed with a few striae near scrobes. Mesopleural cavity poorly defined.



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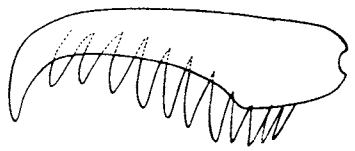

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Figs. 61-62. *Enicospilus isshikii* (UCHIDA) ♀, fenestra (61), hind claw (62).

Forewing 10 mm. long. Fenestra (Fig. 61) extending from nearly base to apical 1/3 of 1st radial abscissa. Proximal sclerome heavily sclerotized except for the apical angle, hairy both above and below, without appendix; quadra ill-defined; distal sclerome sickle-formed. Radius with 1st abscissa strongly sinuate, thickest at basal 1/3, and about 6/11 as long as 2nd abscissa; transverse brace approximately in the ratio 2:7:4 (11:38:22); discocubitus roundly curved; discoidal cell exceptionally short, broadest at middle; 2nd recurrent and basal abscissa of subdiscoideus forming an acute angle, the latter less than thrice as long as the former; nervulus interstitial to slightly postfurcal. Superior and inferior nervellar abscissae about 21:6, the former and discoidella forming a right angle. Hind claw as in Fig. 62.

Abdominal segment I feebly curved in profile, apical and trans-spiracular widths subequal. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

♂ Undescribed. Similar to female, trans-tentorial furrow poorly defined, distal sclerome heavily sclerotized, body slightly darker, abdominal apex not black.

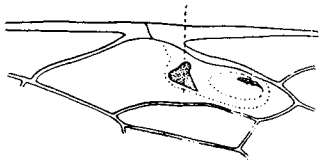
Allotype ♂: Formosa, Tikusiko (nr. Taihoku), 16. IX. 1939 (Ko & Ke).
Further specimen: Japan, Tokusa, Yamaguchi, 1♀.

Enicospilus tainanensis (UCHIDA)

1923 *Henicospilus tainanensis* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:226, ♂. (Formosa: Tainan, Shinka)

♂. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity poorly defined. Labrum about 4/5 as long as malar space. Clypeus about 18 x 35, moderately convex, sparsely, shallowly punctate; anterior submarginal ridge rather distinct; trans-tentorial furrow short, shallow; supraclypeal region and sides of face with fine, distinct punctures. Frontal tubercle rounded, prominent. Antenna thick, slightly shorter than body. Ocellar triangle rather raised. Greatest widths of temple and eye in profile about 15:40.

Propleura for the most part finely punctato-striate. Mesonotum granulated; mesopleura superiorly finely punctate and inferiorly closely punctato-striate; mesopleural cavity short, broad and rather shallow. Scutellum finely punctate,



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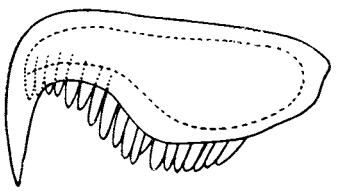

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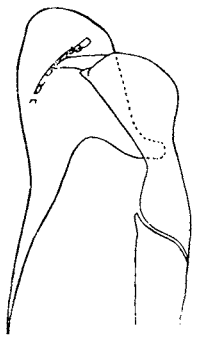
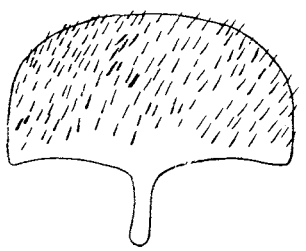
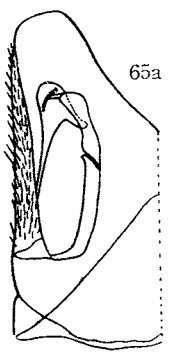


65b



65d



65a

65c

Figs. 63-65. *Enicospilus tainanensis* (UCHIDA) ♂, fenestra (63), hind claw (64), male genitalia —65a. dorsal view of right-hand paramere (with volsella), 65b. right-hand volsella (more enlarged), 65c. right lateral plate of aedeagus, 65d. hypandrium.

laterally sharply margined, apical 1/3 with a few longitudinal striae. Propodeum roundish; apical area with strong, widely separated, longitudinal, oblique, or irregularly arranged carinae; transverse ridge strongly arcuate.

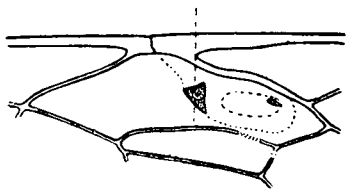
Forewing 15 mm. long. Fenestra (Fig. 63) extending from base to apical 1/5 of 1st radial abscissa. Proximal sclerome subtriangular, hairless above and hairy below, with anterior corner rounded; appendix obscure; quadra rather long, well defined; central sclerome linear, situated at apex of anterior quadral margin. Radius with 1st abscissa about 3/5 as long as 2nd, weakly sinuate, basally thickened and thickest at a point of about basal 1/3; transverse brace approximately in the ratio 2:3.2:2 (25:40:25); 2nd recurrent and basal abscissa of subdiscoideus forming a narrow obtuse angle, the latter about 4 times as long as the former; 2nd discoidal cell broadest much apicad to middle; nervulus interstitial or slightly antefurcal. Superior and inferior nervellar abscissae about 34:15, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 64.

Abdominal segment I subequal in length to II, weakly curve in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying apicad to 1/3 and gastrocoeli, just basad to middle. Genitalia as in Fig. 65 (a-d).

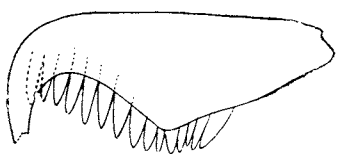
♀ (Undescribed). Similar to male, but quadra larger, angle formed by 2nd recurrent and basal abscissa of subdiscoideus wider; hind claw with fewer teeth.

Allotype ♀: Formosa, Kagi, 10. XII. 1927 (S. TOYOTA).

Parallotypes: Formosa, Kagi, 1♀; Shirin, 1♀; Taihoku, 1♀. Philippines, Los Banos, 1♀.



66



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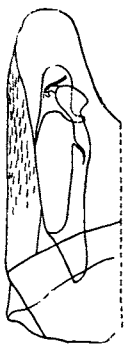
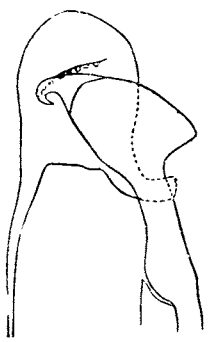


68a

68b



68c

Figs. 66-68. *Enicospilus concavus*, sp. nov. ♂, fenestra (66), hind claw (67), male genitalia—68a. dorsal view of right-hand paramere (with volsella), 68b. right-hand volsella (more enlarged), 68c. right lateral plate of aedeagus.

Further specimens: Formosa, Shiotome, 1♂; Taihoku, 3♂♂.

Enicospilus concavus, sp. nov.

♂. Closely similar to preceding species as redescribed above; but scutellar and propodeal carinae weaker; propodeum with a roundish median concavity near apical 2/3. Proximal sclerome (Fig. 66) with anterior and apical margins straight, not concavely curved; central sclerome much shorter and not lying on anterior quadral margin; mesonotum with 3 fuscous stripes. Hind claw and genitalia as in Fig. 67 and 68 (a-c) respectively.

Holotype♂: Formosa, Taihoku, 24. I. 1932, reared from *Polydesma ambricola* BOISD. (Lepidoptera: Noctuidae) by J. SONAN.

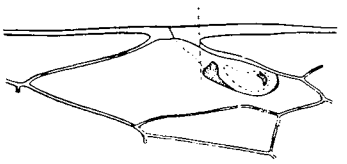
Paratype: Formosa, Taihoku, 1♂.

Enicospilus cushmani, nom. nov.

1937 *Enicospilus sauteri* CUSHMAN, Arb. morph. tax. Ent. Berl.-Dahl. 4(4):310, fig., ♂. (Formosa: Taihorin). (Name preoccupied by *Henicospilus sauteri* ENDERLEIN, 1921).

♀ (Undescribed. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity poorly defined. Labrum about 5/7 as long as malar space. Clypeus about 15 x 25, anterior submarginal ridge arcuate, rather distinct. Trans-tentorial furrow broad, shallow. Face sparsely, feebly punctate. Frontal tubercle linear, rather prominent. Antenna almost as long as body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle moderately raised. Greatest widths of temple and eye in profile about 12:33.

Propleura moderately punctate, with a few distinct striae near scrobes. Mesonotum granulated; mesopleura obscurely striato-punctate, and with a few short, broad, strong striae near superior corners, and inferiorly with strong striae, which are gradually weakened towards posterior and superior margins; mesopleural cavity small, rounded and shallow. Scutellum finely punctate, laterally sharply margined; apical 2/3 with a few distinct longitudinal striae. Metapleura evenly, longitudinally and finely striate. Propodeum ellipsoid; apical area with numerous broad, strong, interposed and rather regular carinae; transverse ridge strong, arcuate.



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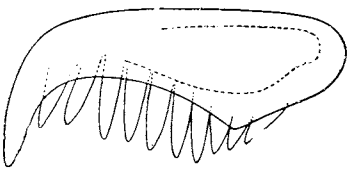


70

Figs. 69-70. *Enicospilus cushmani*, nom. nov. ♀, fenestra (69), hind claw (70).

Forewing 17 mm. long. Fenestra (Fig. 69) extending from basal 1/4 to apical 1/5 of 1st radial abscissa. Proximal sclerome hairy both above and below, basally obliquely truncate, apical angle produced; appendix linear, very weakly sclerotized; quadra moderate-sized, rather well defined; central sclerome lunate, situated at antero-apical corner of quadra. Radius with 1st abscissa basally thickened, slightly tapering off toward apex and about 4/5 as long as 2nd abscissa; transverse brace approximately in the ratio 2:3.1:2.5 (30:47:38); 2nd discoidal cell very long, broadest near apical 1/4; 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about thrice as long as the former; nervulus antefurcal. Superior and inferior nervellar abscissae about 30:13, the former and discoidella forming a narrow obtuse angle. Hind claw as in Fig. 70.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, slightly basad to middle.

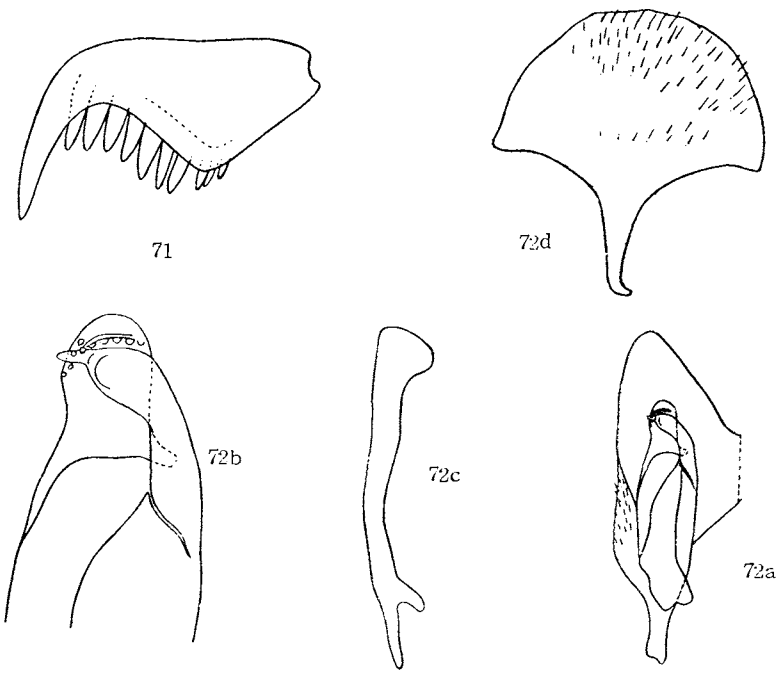
Testaceous. Mandibular apices brown; mesonotal stripes light brown; abdominal segment III and following ones with a fulvous dorsal ridge.

Allotype ♀: Formosa, Kagi, 20. XI. 1926 (S. TOYOTA).

Parallotype: Formosa, Koshun, 1♀.

Enicospilus flavocephalus (KBY.)

1900 *Henicospilus flavocephalus* KIRBY, Monog. Christ. Isl. Faun. p. 82. (Christmas Is.)



Figs. 71-72. *Enicospilus flavocephalus* (KBY.) ♂, hind claw (71), male genitalia—72a. dorsal view of right-hand paramere (with volsella), 72b. right-hand volsella (more enlarged), 72c. right lateral plate of aedeagus, 72d. hypandrium.

1912 *H. flavocephalus*, MORLEY, Rev. Ichr., 1:45.
1926 *H. similis* MATSUMURA & UCHIDA Ins. Mats. 1:72, ♂ (Riu Kius)
1928 *H. flavocephalus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:221-222, ♀ ♂. (Formosa: Baibara, Tainan)
1937 *Enicospilus flavocephalus* CUSHMAN, Arb. morph. tax. Ent. Berl.-Dahl., 4:506-507, fig. 3, ♀. (Formosa: Taihorin)

The following notes may be supplementary to the redescription by CUSHMAN.

♀ ♂. Mandible strongly twisted; basal concavity triangular and shallow. Labrum about one half as long as malar space; anteriorly moderately convex. Clypeus about 14 x 24, trans-tentorial furrow irrecognizable. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle raised. Greatest widths of temple and eye in profile about 10:32. Mesopleural cavity short, shallow. Scutellum laterally sharply margined, basally sparsely punctate, apical 2/3 with numerous longitudinal striae. Propodeum roundish, with numerous fine, close, more or less arcuate carinae on apical area; transverse ridge weakly undulated. Forewing 11–14 mm. long. Nervulus antefurcal or interstitial. Superior and inferior nervellar abscissae about 32:8, the former and discoidella forming almost a right angle. Hind claw as in Fig. 71.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli basad to middle. Genitalia as in Fig. 72 (a–d).

Formosa: Kagi, 1♀; Kappanzan, 1♂; Nanto, 1♂; Shinten, 1♀, 1♂; Sikikum, 1♂; Takao, 1♀; Tainan, 1 ex. (♀ or ♂); Taihoku, 3♀♀, 5♂♂; Takezaki, 1♂.

Daitozima: 3♀♀, 4♂♂.

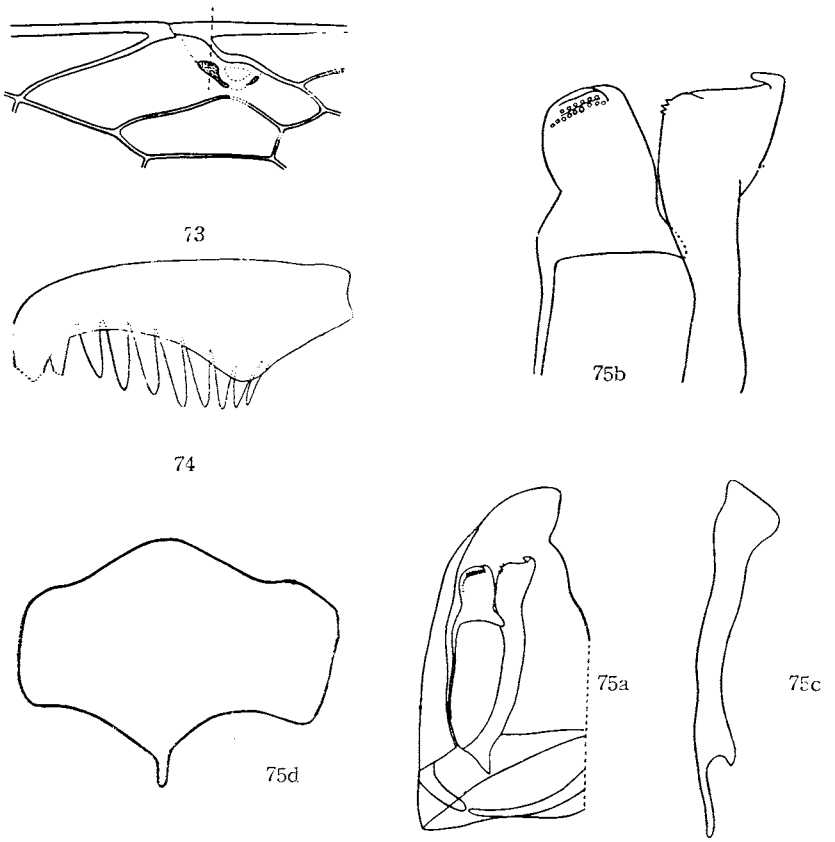
Riu Kius: Naha, 1♀.

Enicospilus nigropictus (MATS.)

1912 *Ophion nigropictus* MATSUMURA, Thous. Ins. Jap. Suppl., 5:113. pl. 48, fig. 2, ♀. (Riu Kius)
1928 *Dicamptus nigropictus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:211, ♂♀. (Formosa: Baibara, Kyuhaton, Tompo; Riu Kius; Korea; Japan: Honshu)
1937 *Enicospilus flavoplagiatus* CUSHMAN, Indian Forest Rec. (n. s.) Ent. 3(7): 144, fig. 1, ♀♂ (India: Dehra Dun). (syn. nov.)

♀ ♂. Head distinctly narrowed behind eyes. Mandible not strongly twisted; basal concavity lunular, short and shallow; superior and inferior teeth subequal in length. Labrum about 5/7 as long as malar space. Clypeus about 22 x 35, faintly, sparsely punctate, nose-like, strongly convex; anterior marginal area abruptly deflexed, and in profile forming an acute angle with the clypeal curvature in general; trans-tentorial furrow arcuate, scarcely recognizable. Face with a narrow, rather deep depression between either antennal insertion and its nearest inner orbit. Frontal tubercle weak, oblong. Antenna longer than body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle raised. Greatest widths of temple and eye in profile about 18:45. Basal propodeal area exceptionaly short,

about 8:75 as long as apical propodeal area. Propodeal carinae strong, not informly curved.



Figs. 73-75. *Exicospilus nigropictus* (MATS.) fenestra ♀ (73), hind claw ♀ (74), male genitalia —75a. dorsal view of right-hand paramere (with volsella), 75b. right-hand volsella (more enlarged), 75c. right lateral plate of aedeagus, 75d. hypandrium.

Forewing 25 mm. long. Fenestra (Fig. 73) small, extending from basal 1/3 to apical 1/2 of 1st radial abscissa; proximal sclerome hairless both above and below. Radial cell basally hairless; radius with 1st abscissa strongly bisinuate, thickest at basal 1/3; and about 4/7 as long as 2nd abscissa; transverse brace approximately in the ratio 2:2.5:2 (44:55:45); 2nd recurrent and basal abscissa of subdiscoideus forming a narrow obtuse angle, the latter about thrice as long as the former; discocubitus rather distinctly geniculated; 2nd discoidal cell broadest at a point of about apical 1/3; nervulus antefurcal. Superior and inferior nervellar abscissae about 37:23; the former and discoidella forming an obtuse angle. Hind claw as in Fig. 74.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying apicad to apical 1/3; gastrocoeli, basad to middle.

♂. Essentially similar to female. Propodeal carinae broader and stronger, metapleura and propodeum not separated by a distinct, strong carinae. Fenestra extending from base to apical 3/4 of 1st radial abscissa, the latter about 1/2 as long as 2nd abscissa; transverse brace approximately 2:2.7:2.7 (45:60:60). Superior and inferior nervellar abscissae about 30:22. Genitalia as in Fig. 75 (a–d).

Fukien: 2♂♂.

Formosa: Kyuhabon, 1♀; Musha, 1♀; Shinten, 1♀.

Japan: Nagano, 1♂; Nikko, 1♀.

Enicospilus uchidae, nom. nov.

1928 *Dicamptus nigropictus* var. *fuscus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:211-212, ♀. (Formosa: Baibara). (Name preoccupied by *Henicospilus fuscus* Roman, 1913).

♀. Head narrowed behind eyes and in dorsal aspect with a very distinct constriction at each side between eye and temple. Mandible not strongly twisted; basal concavity subtriangular, larger and deeper than in the preceding species; superior and inferior teeth subequal in length. Labrum about 3/4 as long as malar space. Clypeus about 40 x 25, moderately convex; anterior margin flattened; anterior submarginal ridge gradually sloping down to its surroundings; transtentorial furrow irrecognizable. Frontal tubercle weak, oval. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle raised. Greatest widths of temple and eye in profile about 38:70.

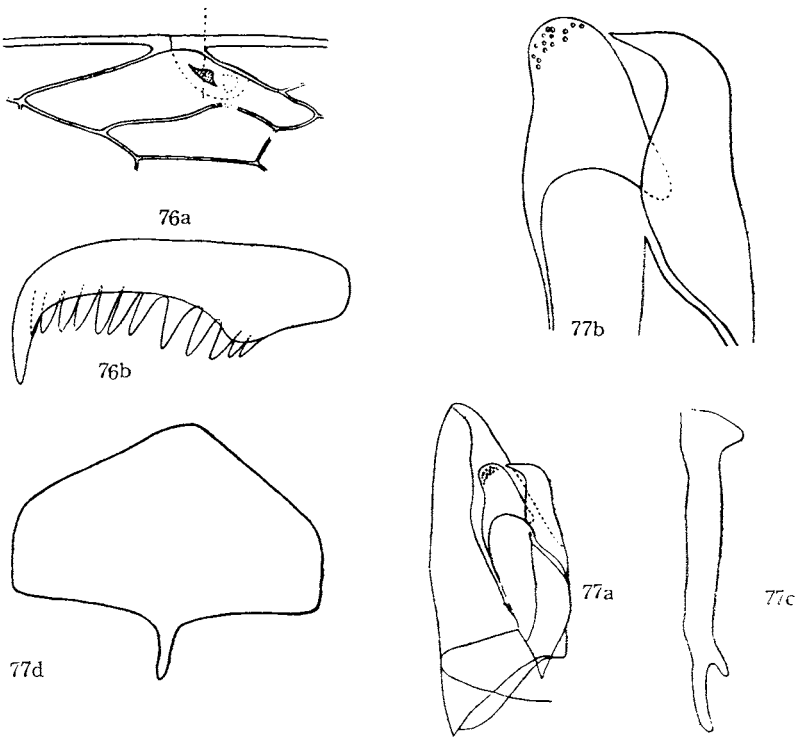
Mesopleural cavity short and broad. Scutellum sparsely punctate, apical half with a few fine striae, and apical 2/3 of lateral margins weakly carinate. Propodeum rounded; apical area with distinct, irregularly arranged carinae; transverse ridge undulated.

Forewing 25 mm. long. Fenestra (Fig. 76a) small, extending from base to apical 1/2 of 1st radial abscissa; proximal sclerome broadly subtriangular, hairless both above and below. Radius with 1st abscissa about 1/2 as long as 2nd abscissa; transverse brace approximately in the ratio 2:2:2 (56:56:56); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle, the latter about thrice as long as the former; discocubitus strongly curved; 2nd discoidal cell broadest at a point of apical 1/3; nervulus interstitial to slightly antefurcal. Superior and inferior nervellar abscissae about 45:20, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 76b.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying apicad to apical 3rd; gastrocoeli, far basad to middle.

Testaceous. Ocellar triangle, mesonotal stripes, mesosternum and a spot on tergum III dark brown; abdomen beyond segment IV brownish.

♂ (Undescribed). Essentially similar to female. Genitalia as in Fig. 77 (a–d).



Figs. 76 77. *Enicospilus uchidae*, nom. nov. ♀, fenestra (76a), hind claw (76b), male genitalia—77a. dorsal view of right-hand paramere (with volsella), 77b. right-hand volsella (more enlarged), 77c. right lateral plate of aedeagus, 77d. hypandrium.

Allotype ♂: Formosa, Kyuhabon, 20. VII. 1925 (S. Issiki).

Parallotype: Formosa, Taiheizan, 1♂.

Further specimens: Formosa, Kyuhabon, 2♀♀.

This species together with the preceding species represent a very distinct group in the genus (cf. synopsis, couplet 10). Superficially, they are quite similar but each has very distinct characters (cf. synopsis, couplet 11). An examination of the male genitalia as well as tarsal claws also definitely confirms the conclusion that *uchidae* is much more than a variety of *nigropictus* as originally supposed by Uchida.

Enicospilus selmatos, sp. nov.

♀. Head distinctly narrowed behind eyes. Mandible strongly twisted; basal concavity poorly defined. Labrum almost as long as malar space. Clypeus about 20 x 35, subpolished, evenly convex; trans-tentorial furrow irrecognizable. Frontal tubercle oval, improminent. Antenna thick, shorter than body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle raised. Greatest widths of temple and eye in profile about 18:40.

Propleura evenly, finely striate. Mesonotum feebly punctate; mesopleura very

finely punctato-striate, superiorly moderately punctate; mesopleural cavity long and shallow. Metapleura superiorly densely punctate and inferiorly weakly punctato-striate. Scutellum moderately punctate, medially narrowly keeled near apex, laterally sharply margined. Propodeum rounded; apical area with strong carinae, which being curved, short and dense, sometimes the lateral ones oblique, long, widely separated and regularly arranged; transverse ridge strong.

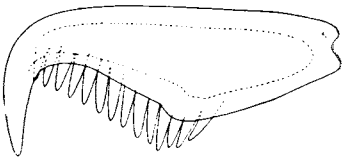


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Fig. 78. Hind claw of *Enicospilus selmatos*, sp. nov. ♀.

Forewing 21 mm. long. Fenestra (Fig. 79) extending from basal 1/4 to apical 1/4 of 1st radial abscissa. Proximal sclerome hairy both above and below; quadra medium-sized, well-defined; central sclerome sublunate. Radius with 1st abscissa strongly thickened at a point basad to middle, tapering off toward both ends, about 4/7 as long as 2nd abscissa; transverse brace approximately 2:2.4:2 (40:48:42); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter more than thrice as long as the former; nervulus antefurcal. Superior and inferior nervellar abscissae about 50:15, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 78.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3, and gastrocoeli, far basad to middle.

Testaceous. Mandibular apices, antennae (basally), mesonotal stripes (the lateral ones often smoky) and most part of mesosternum dark brown; wings hyaline, costa, pterostigma, radius and basal veins brown; abdomen (excluding segments I-II) brownish.

♂. Similar to female in structure and color pattern, but central sclerome smaller and rounded. Hind claw ?. Forewing 19 mm. long. Genitalia as in Fig. 80 (a-d).

Holotype ♀: Formosa, Taihoku, 12. XII. 1925 (J. SONAN).

Allotype ♂: Formosa, Nanto-Ruigaurin, 18. XII. 1916 (T. SHIRAKI).

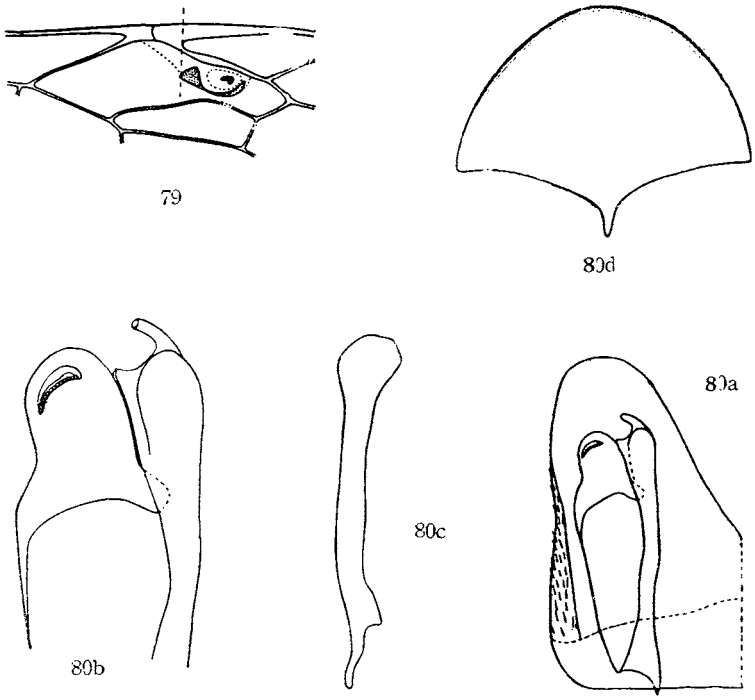
Paratypes: Formosa, Shinten, 2♀♀; Taihoku, 1♀.

Rather near *uchidae* and its allies, but the wing markings and propodeal sculpture are different. The name "*selmatos*", a seat or throne, is given in allusion to the dorso-lateral carinae of propodeum.

Enicospilus gyochiensis (UCHIDA)

1928 *Henicospilus gyochiensis* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:222, pl. 7, fig. 3, ♂ (Formosa: Gyochi).

♂. Mandible strongly twisted; basal concavity poorly defined. Labrum about 1/2 as long as malar space. Clypeus about 15 x 25, evenly convex; trans-tentorial

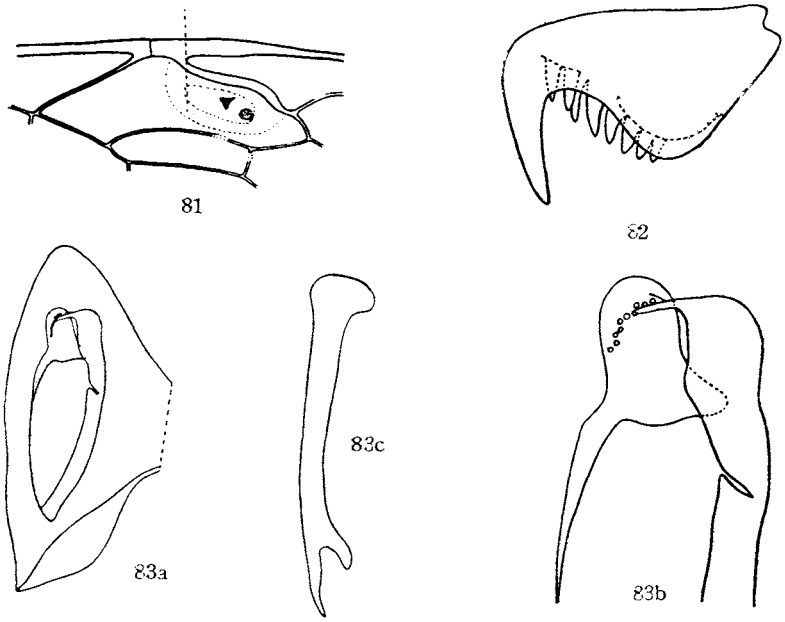


Figs. 79-80. *Enicospilus selmatos*, sp. nov., fenestra ♀ (79), male genitalia—80a dorsal view of right-hand paramere (with volsella), 80b. right-hand volsella (more enlarged), 80c. right lateral plate of aedeagus, 80d. hypandrium.

furrow hardly recognizable. Frontal tubercle linear, prominent. Antenno-ocellar line: latero-ocellar line about 10:15; ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 15:32.

Forewing 13–16 mm. long. Fenestra (Fig. 81) large, extending from base to apical 1/6 of 1st radial abscissa; proximal sclerome represented on the proximal part of quadra by a roundish concave area; quadra medium-sized, ill-defined, with 2 central scleromes, the basal one triangular, and anteriorly almost paralled to metacarpus, the apical one roundish and with an anal appendix which is more weakly sclerotized and runs along anal quadral margin toward the quadral base. Radius with 1st abscissa about 1/2 as long as 2nd abscissa, transverse brace approximately 2:4.5:2.5 (20:45:25); 2nd discoidal cell very long, slender, evenly broad; 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about 4 times as long as the former; nervulus interstitial or antefurcal. Superior and inferior nervellar abscissae about 32:11; the former and discoidella forming an obtuse angle. Hind claw as in Fig. 82.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width more or less greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3; gastrocoeli, immediately basad to middle. Genitalia as in Fig. 83 (a–c).



Figs. 81-83. *Enicospilus gyochiensis* (UCHIDA) ♂, fenestra (81), hind claw (82), male genitalia —83a. dorsal view of right-hand paramere (with volsella), 83b. right-hand volsella (more enlarged), 83c. right lateral plate of aedeagus.

Mesonotum always with 3 brownish to dark brown stripes, the median one apically obsolete.

♀ (Undescribed). Essentially similar to male.

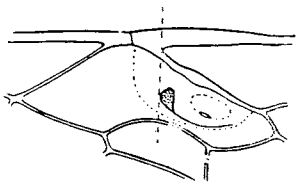
Allotype ♀: Formosa, Nichigetsutan, 9. VII. 1939 (T. MIWA).

Further specimens: Formosa, Kanshirei, 1♂; Rato, 1♂; Suisha, 1♂; Taito, 1♂.

Enicospilus bullatus, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity lunular. Labrum about 1/2 as long as malar space. Clypeus about 18 x 13, moderately convex, with anterior marginal area gently depressed; trans-tentorial furrow irrecognizable. Face sparsely punctate. Frontal tubercle oblong, improminent. Antenna nearly as long as body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 7:30.

Propleura sparsely punctate, with a few fine striae near scrobes. Mesonotum granulated; mesopleura inferiorly closely, finely striate, superiorly sparsely punctate; mesopleural cavity rounded, shallow. Scutellum broad, sparsely, moderately punctate, laterally sharply margined. Propodeum ellipsoid; apical area faintly, finely carinate, medially with a longitudinal and laterally numerous irregular, somewhat oblique striae; transverse ridge poorly developed.



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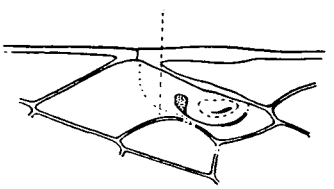


85

Figs. 84-85. Fenestrae of *Enicospilus bullatus*, sp. nov. ♀ (84) and *E. obliquus*, sp. nov. ♂ (85).

Forewing 9 mm. long. Fenestra Fig. 84. extending from base to apical 1/5 of 1st radial abscissa. Proximal sclerome ob-pyriform, hairless both above and below, appendix weakly sclerotized; quadra small; central sclerome elongate, lying near middle of posterior quadral margin. Radius with 1st abscissa strongly thickened just basad to middle, about 6/7 as long as 2nd abscissa; radial cell basally exceptionally broadened; transverse brace approximately in the ratio 2:7:4.4 (9:32:20); 2nd recurrent and basal abscissa of subdiscoideus forming a noticeably acute angle, the latter about thrice as long as the former; 1st abscissa of discocubitus strongly curved, with a pale mark near middle; 2nd discoidal cell broadest near middle, apically sloping analwards; nervulus interstitial. Superior and inferior nervellar abscissae about 18:6, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 86.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width subequal to trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, immediately basad to middle.

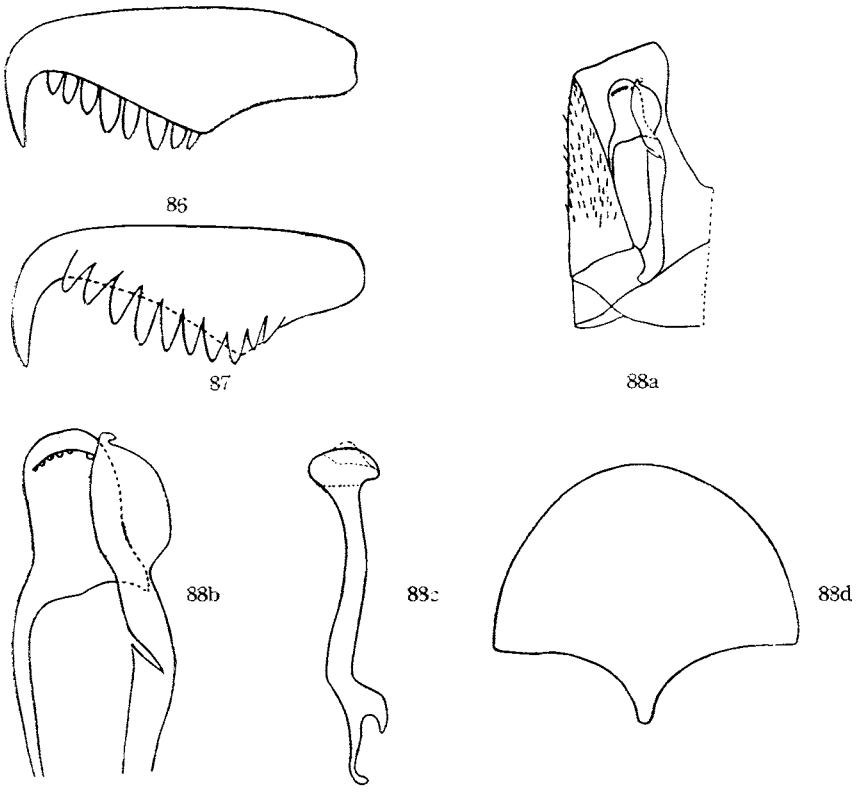
Testaceous. Mandibular apices, a stripe extending from supraclypeal region to ocellar triangle, 3 mesonotal stripes (the median one and apical halves of the lateral ones paler), mesosternum, metapleura (inferior halves) and abdomen (excluding segments I-IV) brownish to brown; wings hyaline, pterostigma flavous.

Holotype ♀: Formosa, Kanshirei, 19. XI. 1928 (J. SONAN).

The exceptionally strong proximal sclerome, the site of the whitish-mark on discocubitus, the very acute apico-anal angle of the 2nd discoidal cell and the sculpture on mesopleura combinedly render this species easily distinguishable from its congeners. The name "*bullatus*", bubbling or blistered, is proposed in allusion to the proximal sclerome.

Enicospilus obliquus, sp. nov.

♂. Similar to the preceding species except in the following points: proximal sclerome (Fig. 85) almost ob-cordiform, well defined; appendix more slender, more strongly produced, nearly reaching radial abscissa; central sclerome almost as long as quadra; radial cell normal; 1st radial abscissa about 2/3 as long as 2nd; discocubital cell slightly but distinctly contracted near middle; 2nd discoidal cell apically



Figs. 86–88. *Enicospilus bullatus*, sp. nov., hind claw ♀ (86). *E. obliquus*, sp. nov., hind claw ♂ (87), male genitalia—88a. dorsal view of right-hand paramere (with volsella), 88b. right-hand volsella (more enlarged), 88c. right lateral plate of aedeagus, 88d. hypandrium.

not noticeably sloping analwards; 2nd recurrent and basal abscissa of subdiscoideus forming an acute angle, the latter less than thrice as long as the former; nervulus interstitial. Superior and inferior nervellar abscissae about 18:6, discoidella and superior nervellar abscissa forming a narrow obtuse angle; stripes on face and vertex flavo-testaceous; mesonotal stripes obscure; mesopleura and mesosternum entirely testaceous. Genitalia as in Fig. 88 (a–d).

Holotype ♂ : Formosa, Kuraru, 12–15. III. 1931 (T. SHIRAKI).

The name "*obliquus*" refers to the central sclerome.

Enicospilus bifasciatus (UCHIDA)

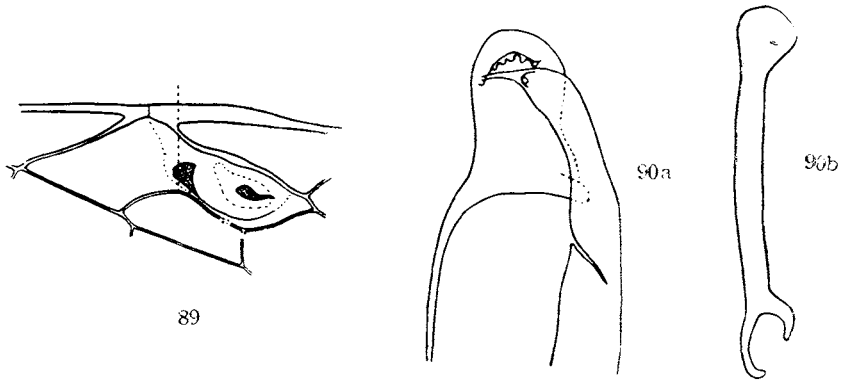
1928 *Henicospilus bifasciatus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:221. pl. 5, fig. 12, ♀ (Formosa: Baibara).

1937 *Enicospilus bifasciatus* CUSHMAN, Arb. morph. tax. Ent. Berl.-Dahl. 4:305, fig. 6, ♀ ♂ (Formosa: Hoozan, Taihorin).

The following notes may be supplementary to the redescription by CUSHMAN.

♂ ♀. Mandible exceedingly strongly twisted; basal concavity short, rather distinct. Labrum about 3/7 as long as malar space. Clypeus about 18 x 35, moder-

ately convex, with median line more or less distinctly carinate; trans-tentorial furrow arcuate. Frontal tubercle oblong, prominent. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle raised. Greatest widths of temple and eye in profile about 13:45. Mesopleural cavity short and shallow. Forewing 13 mm. long. Fenestra as in Fig. 89. Radius with 1st abscissa very thick, about 2/3 as long as 2nd



Figs. 89-90. *Enicospilus bifasciatus* (UCHIDA) ♂, fenestra (89), male genitalia—90a. right-hand volsella, 90b. right lateral plate of aedeagus.

abscissa. Superior and inferior nervellar abscissae about 22:12; the former and discoidella forming an obtuse angle.

Abdominal segment I subequal in length to II, the former feebly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles at apical 1/3, and gastrocoeli, immediately basad to middle. Genitalia as in Fig. 90 (a-b).

♀. Entirely same as male, but median clypeal carina irrecognizable.

Formosa: Kirakei, 1♂; Koshun, 1♂; Musha, 1♀; Shinten, 1♂; Tabo, 1♀; Taihoku, 1♀; Urai, 1♂.

Enicospilus sauteri (ENDERL.)

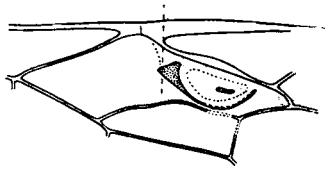
1921 *Henicospilus sauteri* ENDERLEIN, Stett. Ent. Zeitg., 82:24, ♀. (Formosa: Pilam).

♀. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity lunular, rather distinct; superior tooth much longer than inferior. Labrum about as long as malar space. Clypeus about 15:25, moderately convex, trans-tentorial furrow scarcely recognizable. Face finely punctate. Frontal tubercle ovoid, rather prominent. Antenna nearly as long as body; antenno-ocellar and atero-ocellar lines about 8:5. Ocellar triangle raised. Greatest widths of temple and eye in profile about 10:30.

Propleura feebly punctate, more or less rugose near scrobes. Mesonotum granulated; meso- and metapleura finely punctate, the former more sparsely so and intermixed with very few punctato-striae near inferior corners; mesopleural

cavity rather shallow, moderately long. Scutellum narrow, sparsely punctate and laterally sharply margined. Propodeum ellipsoid; apical area with moderately strong, irregularly arranged, more or less longitudinal carinae; transverse ridge rather stongly arcuated.

Forewing 13 mm. long. Fenestra (Fig. 91) extending from base to apical 1/6 of 1st radial abscissa. Proximal sclerome hairy both above and below; appendix strongly curved, running along posterior and apical margin of fenestra; quadra



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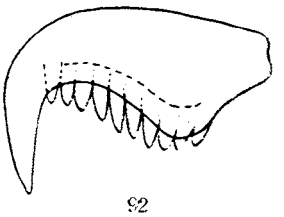


92

Figs. 91-92. *Enicospilus sauteri* (ENDERL.) ♀. fenestra (91), hind claw (92).

small, ill-defined; central sclerome parallel to 1st abscissa of radius which is thickest at middle and about 2/3 as long as 2nd abscissa; transverse brace approximately in the ratio 2:4.5:3.5(20:45:35); 2nd discoidal cell broadest at a point apicad to middle; 1st abscissa of discocubitus with apical 2/5 parallel to radius as well as subdiscoideus; 2nd recurrent and basal abscissa of subdiscoideus forming a broad, acute angle, the latter about thrice as long as the former; nervulus interstitial. Superior and inferior nervellar abscissae about 25:10; the former and discoidella forming a narrow obtuse angle. Hind claw as in Fig. 92.

Abdominal segment I subequal in length to II, faintly curved in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

Testaceous. Mandibular apices brown; mesonotal stripes blackish; wings hyaline, scleromes and pterostigma fulvous; radial abscissa, costa and most of other veins testaceous.

♂ (Undescribed). Very similar to female. Greatest widths of temple and eye in profile about 15:35. Metanotum striato-punctate. Superior and inferior nervellar abscissae about 30:10.

Allotype ♂: Formosa, Suigen-Suogun, 12. VII. 1939 (J. SONAN)

Parallotype: Formosa, Suigen-Suogun, 1♂.

Further specimens: Formosa, Arisan, 1 ex. (♀ or ♂); Kyuhabon, 1♀; Nichigetsutan, 1♀; Rantaizan, 1♀.

With a little doubt, the above-mentioned specimens are here referred to ENDERLEIN'S species, since the original description is rather inadequate and no authentical information about the type is available.

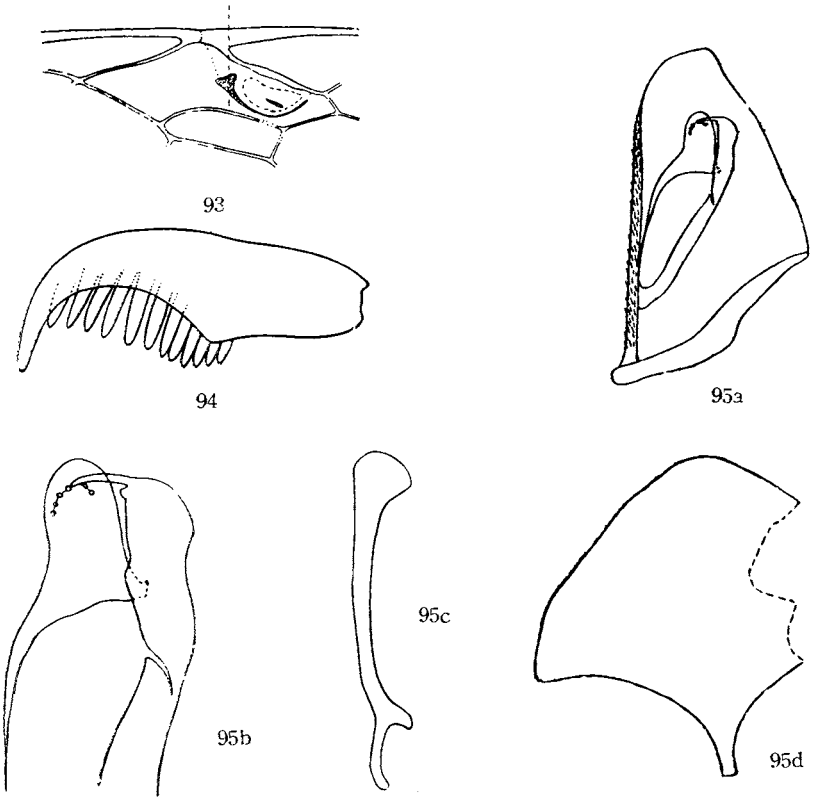
Enicospilus molopos, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible strongly twisted; basal

concavity short and shallow. Labrum about 7/5 as long as malar space. Clypeus about 15 x 22, evenly convex, trans-tentorial furrow arcuate, poorly defined. Face finely, sparsely, shallowly punctate; frontal tubercle roundish, rather prominent. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 11:37.

Propleura faintly punctate, with a few obscure striae near scrobes. Mesonotum subpolished; mesopleura very weakly striato-punctate, but inferiorly distinctly striated; mesopleural cavity rather broad and shallow. Scutellum weakly punctate. Propodeum roundish; apical area with numerous strong, irregular carinae, those at lateral areas being oblique; transverse ridge sharply arcuate.

Forewing 12.5 mm. long. Fenestra (Fig. 93) extending from base to apical 1/6 of 1st radial abscissa. Proximal sclerome triangular, hairy both above and below;



Figs 93-95. *Enicospilus molopos*, sp. nov., fenestra ♀ (93), hind claw ♀, (94) male genitalia—95a dorsal view of right-hand paramere (with volsella), 95b. right-hand volsella (more enlarged), 95c. right lateral plate of aedeagus, 95d. hypandrium.

appendix distinct, uniformly slender, with apex nearly reaching radius; quadra ill-defined; central sclerome linear. Radius with 1st abscissa thickest near middle, about 5/7 as long as 2nd abscissa; radial cell basally thinly haired; transverse brace approximately in the ratio 2:5:2.4 (18:45:22); 2nd recurrent and basal abscissa of subdiscoideus forming an acute angle, the latter more than thrice as long as the

former; nervulus interstitial. Superior and inferior nervellar abscissae about 24:9, the former and discoidella forming a right angle. Hind claw as in Fig. 94.

Abdominal segment I subequal in length to II, rather curved in profile, apical width slightly greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, far basad to middle.

Testaceous. Mandibular apices, abdominal segment V (apically) and following ones brownish.

♂. Essentially similar to female. Genitalia as in Fig. 95 (a-d). Radial cell basally with very few, fine hairs; 2nd recurrent and basal abscissa of subdiscoideus forming a nearly right angle, the latter thrice as long as the former.

Holotype ♀ : Formosa, Rengechi, 9. X. 1935 (S. ISSIKI).

Allotype ♂ : Formosa, Kappanzan, 18. V. 1930 (J. SONAN).

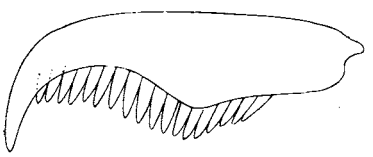
Superficially almost identical with the preceding species, but the metapleura, 2nd discoidal cell and tarsal claws are decidedly different. The specific name "*molopos*", the mark of a wound, is given in allusion to the central sclerome.

Enicopilus analis (MATS. & UCHIDA)

1926 *Henicospilus analis* MATSUMURA & UCHIDA, Ins. Mats., 1:72, pl. 3, fig. 18, ♀ ♂. (Riu Kius: Ishigakijima, Okinawa-honto).
1928 *Henicospilus analis* UCHIDA, Jour. Fac. Agric. Hokkaido. Univ. 21:225, ♀ ♂. (Riu Kius).
1937 *Enicospilus analis* CUSHMAN, Arb. morph. tax. Ent. Berl.-Dahl. 4:307, fig. 9. (Formosa: Taihorin).

♀ ♂. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity triangular. Labrum about as long as malar space. Clypeus about 14 x 25; trans-tentorial furrow arcuate, poorly defined. Frontal tubercle roundish, prominent. Antenno-ocellar and latero-ocellar lines subequal. Greatest widths of temple and eye in profile about 20:45.

Mesopleural cavity poorly defined. Scutellum moderately punctate, occasionally with a few striae at apex. Propodeum rounded; apical area with numerous irregular, somewhat oblique carinae; transverse ridge moderately strong. Nervulus interstitial. Superior and inferior nervellar abscissae about 23:8, the former and discoidella forming a right angle.



96a

Fig. 96a. Hind claw of *Enicospilus analis* (MATS. & UCHIDA), ♂.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width slightly greater than trans-spiracular width. Tergum II with spiracles at apical 1/3. Hind claw and male genitalia as in Figs. 96a and 96(b-d) respectively.

Formosa: Batoran, 1♂; Shinten, 1 ex. (♀ or ♂).

Riu Kius: 1♀.

The transverse brace of this species, as mentioned by CUSHMAN (loc. cit.), is

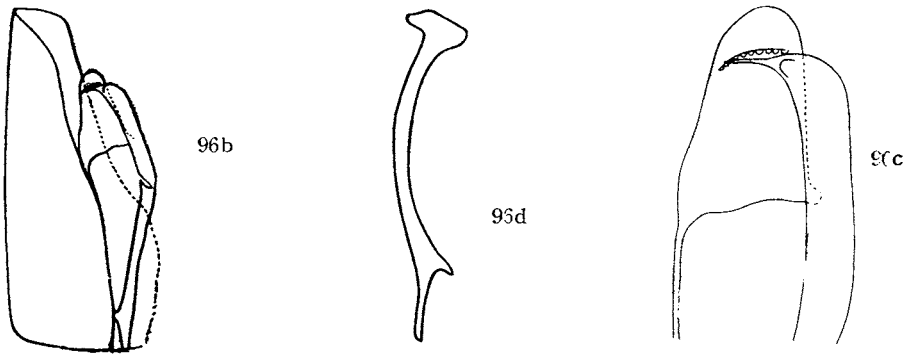
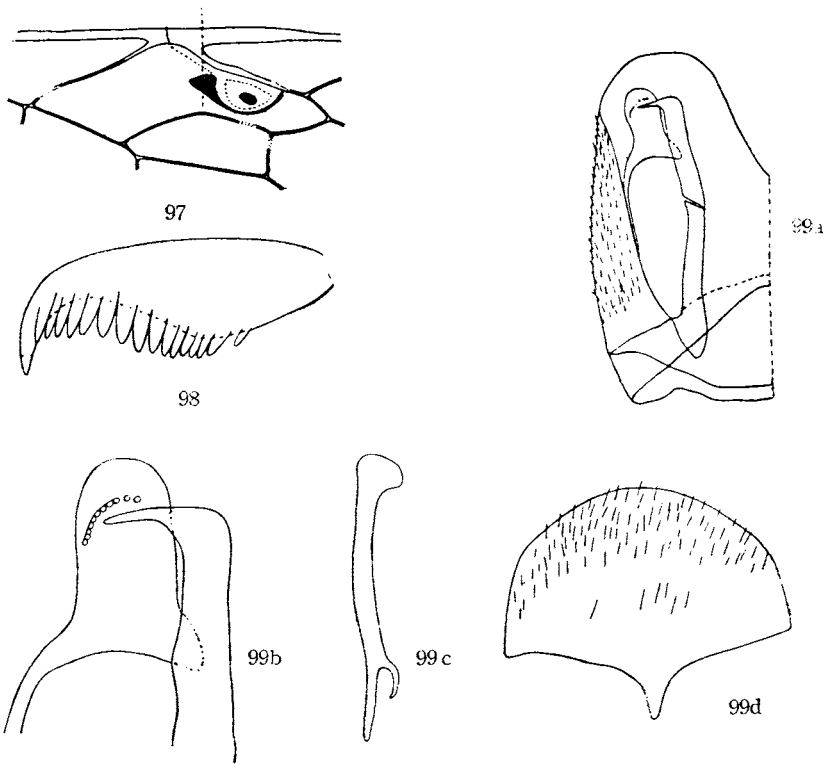


Fig. 96(b-d). Male genitalia of *Enicospilus analis* (MATS. & UCHIDA), 96b. dorsal view of right-hand paramere (with volsella), 96c. right-hand volsella (more enlarged), 96d. right lateral plate of aedeagus.

approximately in the ratio 2:5:3. The same ratio in the specimens at hand is, however, 2:4:3.

Enicospilus nigrivenalis CUSHMAN

1937 *Enicospilus nigrivenalis*, CUSHMAN, Arb. morph. tax. Ent. Berl.-Dahl., 4:307-309, fig. 10, ♀ ♂. (Formosa: Kankau, Taihorin).



Figs. 97-99. *Enicospilus nigrivenalis* CUSHMAN ♂, fenestra (97), hind claw (98), male genitalia—99a. dorsal view of right hand paramere (with volsella), 99b. right-hand volsella (more enlarged) 99c. right lateral plate of aedeagus, 99d. hypandrium.

The following notes may be supplementary to the description by CUSHMAN.

♀ ♂. Mandible polished, exceedingly strongly twisted; basal concavity triangular. Labrum as long as malar space. Clypeus about 15 x 25, moderately convex, anterior submarginal ridge poorly defined; trans-tentorial furrow irrecognizable. Frontal tubercle oblong, slightly prominent. Antenno-ocellar and latero-ocellar lines subequal. Greatest widths of temple and eye in profile about 10 x 30. Mesopleural cavity short, shallow. Nervulus interstitial. Superior and inferior nervellar abscissae about 24:13, discoidella and superior abscissa forming a narrow obtuse angle. Hind claw and genitalia as in Figs. 98 and 99 (a-d) respectively.

Abdominal segment I subequal in length to II, weakly curved in profile.

Formosa: Chipon, 3♀ ♀; Chitsupon, 1♀; Heito, 1♀; Horisha, 1♀; Kanshirei, 2♀ ♀; Kagi, 1♀; Kusukusu, 1♀; Nichigetsutan, 1♀; Suisha, 1♀; Taihoku, 1♀; 1♂; Taito, 1♀.

Daitozima: 1♂.

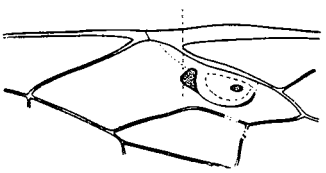
Japan: Tokyo, 1♂.

Enicospilus quintuplex, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity triangular. Labrum as long as malar space. Clypeus about 12 x 24, rather evenly convex, more finely punctate than the other part of face; trans-tentorial furrow irrecognizable. Frontal tubercle ovoid, prominent. Antenna shorter than body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 10:30.

Propleura finely punctate and intermixed with few weak striae near scrobes. Mesonotum finely punctate; mesopleura (excluding superior corners) striato-punctate; mesopleural cavity broad, rather shallow. Scutellum sparsely, finely punctate, laterally strongly margined. Propodeum rounded, with moderate, irregular carinae on apical area, and somewhat arcuate ones at extreme apex; transverse ridge strong.

Forewing 12 mm. long. Fenestra (Fig. 100) extending from base to apical 1/5



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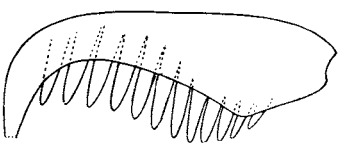


101

Figs. 100-101. *Enicospilus quintuplex*, sp. nov. ♀, fenestra (100), hind claw (101).

of 1st radial abscissa. Proximal sclerome subtriangular, hairy both above and below; appendix rather stout, apically reaching radius; quadra small, semicircular,

well-defined; central sclerome roundish. Radius with 1st abscissa weakly sinuate, basally thickened, about 3/5 as long as 2nd abscissa; transverse brace approximately in the ratio 2:3.5:3(20:35:30); 2nd recurrent and subdiscoideus forming a broad acute angle, the latter less than thrice as long as the former; 1st abscissa of discocubitus apically parallel to radius and to subdiscoideus; 2nd discoidal cell short, broad, basally abruptly narrowed; nervulus interstitial. Superior and inferior nervellar abscissae about 24:12, the former and discoidella forming a right angle. Hind claw as in Fig. 101.

Abdominal segment I subequal in length to II, weakly curved in profile, apical and trans-spiracular widths subequal. Tergum II with spiracles lying at apical 1/3, and gastrocoeli, basad to middle.

Uniformly testaceous, mandibular apices brownish.

Holotype ♀: Fukien, Shaowu, 8. X. 1945. (S. H. CHAO).

Very similar to *E. analis* (MATS. & UCHIDA) in sculpture and in shape of scleromes but differing from that species in metapleura distinctly punctate and scarcely striato-punctate, 2nd cubital abscissa and 2nd recurrent subequal in length instead of 5:3, 2nd discoidal cell apically distinctly broader and with its analo-apical angle almost 90° and abdomen unicolor.

Enicospilus yanagiharai (SONAN)

1940 *Henicospilus yanagiharai* SONAN, Trans. Nat. Hist. Soc. Formosa, 30:371, fig., ♂. (N. Daitojima).

This species is to be most easily distinguished by its stout body, very short clypeus, broad face, broad temples as well as strongly expanded postpetiole.

♂. Mandible long, narrow, strongly twisted, with numerous long, golden hairs in the median furrow; superior tooth much longer than inferior, basal concavity triangular, distinct, smooth, apically rounded. Labrum about 7/10 as long as malar space. Clypeus about 15 x 45; anterior marginal ridge distinct; trans-tentorial furrow moderately shallow. Face closely punctate, but supraclypeal region striato-punctate, and laterally poorly defined. Frontal tubercle weak, rather long. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle strongly raised, and surrounded by a distinct groove; median vertical furrow deep, producing caudad to occipital carina. Greatest widths of temple and eye in profile about 24:32. Mesopleural cavity shallow, moderately long. Scutellum laterally sharply margined.

Forewing 14 mm. long. Fenestra extending from basal 1/5 to apical 1/3 of 1st radial abscissa; proximal sclerome hairless above and hairy below, not uniformly sclerotized, discally semi-transparent; central sclerome also not uniformly sclerotized. Radius with 1st abscissa basally very weakly sinuate, moderately thickened near base and about 3/5 as long as 2nd abscissa; transverse brace approximately in the ratio

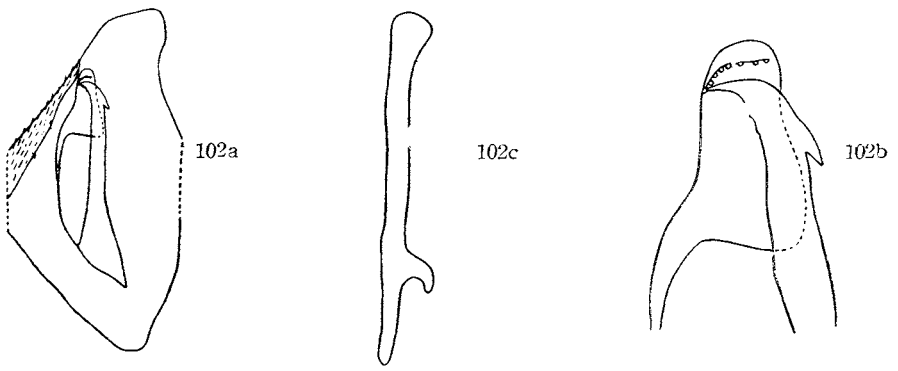


Fig. 102 (a-c). Male genitalia of *Enicospilus yanagiharai* (SONAN)—102a. dorsal view of right-hand paramere (with volsella), 102b. right-hand volsella (more enlarged), 102c. right lateral plate of aedeagus.

of 2:4:3.4(20:40:34); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about thrice as long as the former; 2nd discocubitus basally scarcely curved; discoidal cell broadest apicad to midpoint. Superior and inferior nervellar abscissae about in the ratio 32:8, the former and discoidella forming a narrow obtuse angle.

Abdominal segment I subequal in length to II, feebly curved in profile, apical width much smaller than trans-spiracular width. Tergum II with spiracles lying at apical 3rd and gastrocoeli, basad to middle. Genitalia as in Fig. 102 (a-c).

Redescribed from the holotype.

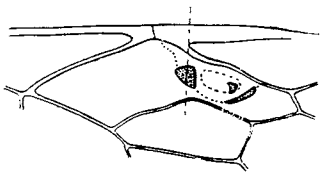
Enicospilus fossatus, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity equilaterally triangular. Labrum about 4/3 as long as malar space. Clypeus convex, about 15 x 30, short and broad, as sparsely punctate as sides of face; trans-tentorial furrow obscure. Supraclypeal region very closely punctate. Frontal tubercle rounded, rather prominent. Antenna shorter than body; antenno-ocellar and latero-ocellar lines about 12:15. Ocellar triangle distinctly raised; vertex and temple polished; median vertical furrow poorly defined. Greatest widths of temple and eye in profile about 14:30.

Mesopleura densely punctate, with more or less distinct striation; mesopleural cavity moderately long and broad. Scutellum evenly, sparsely punctate, laterally sharply margined. Propodeum rounded; apical area neatly, rather strongly reticulated; transverse ridge rather strong.

Forewing 12 mm. long. Fenestra (Fig. 103) extending from base to apical 1/3 of 1st radial abscissa; proximal sclerome hairless above and hairy below; central sclerome situated near apex of quadra. Radius with 1st abscissa very weakly bisinuate, slightly thickened at basal half, and about 2/3 as long as 2nd abscissa; transverse brace about in the ratio 2:4.6:3.8 (15:35:29); 2nd recurrent and basal

abscissa of subdiscoideus forming an obtuse angle, the atter nearly thrice as long as the former; nervulus distinctly antefurcal; superior and inferior nervellar abscissae about 28:8, the former and discoidella forming an obtuse angle.



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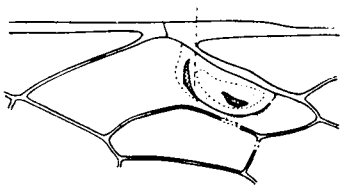


104

Figs. 103-104. Fenestrae of *Enicospilus fossatus*, sp. nov. ♀ (103) and *E. zeugos*, sp. nov. ♀ (104).

Abdominal segment I longer than II, slightly curved in profile, apical and trans-spiracular widths subequal. Tergum II with spiracles lying at apical 1/4, and gastrocoeli, basad to middle; abdominal apex truncate.

Testaceous. Mandibular apices dark brown. Wings hyaline; pterostigma and sclerome yellowish; veins brown.

Holotype ♀: Malay Penin., Johore, 1. X. 1916 (S. KIYATAKE).

The well defined, discally depressed metanotum of this species seems to be one of its "key" characters, for which the name "*fossatus*" is given. In general features, it bears some affinities to *E. yanagiharai* (SONAN).

Enicospilus zeugos, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity poorly defined. Labrum slightly narrower than trans-tentorial width (30:35), and about 5/8 as long as malar space. Clypeus about 14x23, subpolished, rather evenly convex; trans-tentorial furrow irrecognizable. Supraclypeal region obscurely striato-punctate; sides of face closely, finely punctate. Frontal tubercle roundish, improminent. Antenna slender, much longer than body; antenno-ocellar line: latero-ocellar line about 12:15. Ocellar triangle rather prominent. Greatest widths of temple and eye in profile about 12:34.

Propleura punctato-striate, becoming more distinctly so near scrobes. Mesonotum smooth; mesopleura finely punctate, but inferiorly with a few dense punctato-striae; mesopleural cavity short, rather deep. Scutellum polished, laterally sharply margined, basally smooth, apically rugose. Propodeum with apical area strongly rugose; transverse ridge weakly undulated.

Forewing 15.5 mm. long. Fenestra (Fig. 104) extending from nearly base to apical 1/4 of 1st radial abscissa. Proximal sclerome lunate, hairless both above and below; appendix arcuate, weakly sclerotized; quadra medium-sized, well defined; distal sclerome linear; central sclerome crescent-shaped. Radius with 1st abscissa sinuate, strongly thickened except for the apical 1/5; about 4/5 as long as 2nd

abscissa ; transverse brace about 2 :4.4 :2.7 (22 :48 :30) ; 2nd recurrent and basal abscissa of subdiscoideus forming a narrowly obtuse angle, the latter about thrice as long as the former; discocubitus undulated; 2nd discoidal cell broadest just at middle; nervulus antefurcal. Superior and inferior nervellar abscissae about 30 :11, the former and discoidella forming an obtuse angle.

Abdominal segment I subequal in length to II, almost straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle; abdominal apex truncate.

Testaceous. Mandibular apices and lateral stripes of mesonotum blackish; wings hyaline, subcosta and subcostella blackish.

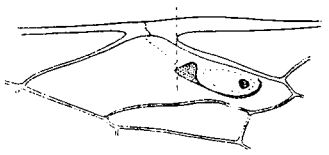
Holotype ♀ : Formosa, Urai, VI. 1931 (J. SONAN).

This new species is built upon a combination of characters of the wings, of which the yoke-like discocubitus is perhaps the most outstanding. The specific name "*zeugos*", a yoke, is proposed accordingly.

Enicospilus nasutus, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible strongly twisted ; basal concavity poorly defined. Labrum about as long as malar space. Clypeus about 15 x 30, nose-like, exceptionally convex, with anterior marginal area abruptly deflexed and in profile, perpendicular to the clypeal curvature in general. Trans-tentorial furrow poorly defined. Face evenly, finely, closely punctate. Frontal tubercle ovoid, improminent. Antenna slightly shorter than body ; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 15 :38.

Propleura subpolished, with feeble, uneven, sparse punctures. Mesopleura superiorly finely punctate and inferiorly closely, finely punctato-striate ; mesopleural cavity small, rounded, shallow. Scutellum evenly, finely punctate, and sharply margined. Propodeum ellipsoid ; apical area with a few strong, sinuate, widely separated carinae, the lateral ones being oblique ; transverse ridge undulated.



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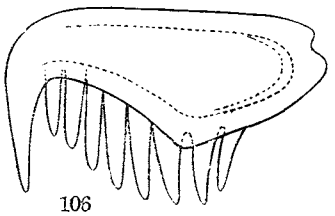


106

Figs. 105-106. *Enicospilus nasutus*, sp. nov. ♀, fenestra(105), hind claw (106).

Forewing 16.5 mm. long. Fenestra (Fig. 105) extending from base to apical 1/4 of 1st radial abscissa. Proximal sclerome hairless above and hairy below, apical angle slightly prolonged ; appendix long, slender, apically reaching radius; quadra medium-sized, well defined ; central sclerome elongate. Radius with 1st abscissa thickened, about 2/3 as long as 2nd abscissa ; transverse brace approximately in

the ratio 2:4.5:3 (22:50:32); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle, the latter about 4 times as long as the former; 2nd discoidal cell narrow, long. Nervulus interstitial or antefurcal. Superior and inferior nervellar abscissae about 50:20, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 106.

Abdominal segments I and II subequal in length, the former faintly curved in profile, and with apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

Testaceous. Mandibular apices, ocellar triangle and mesonotal stripes brown; wings hyaline, costa, pterostigma and most veins dark brown; abdominal segments III and IV (except lateral areas) and following ones smoky.

♂. Similar to the female in sculpture, color pattern and structure, including clypeus and 1st radial abscissa. The tarsal claws are, however, quite different in denticulation, transverse brace approximately in the ratio 2:3.6:2.5 (25:45:32); 2nd discoidal cell slightly shorter and broader; mesonotal stripes and most part of mesosternum dark brown to black.

Holotype ♀ : Formosa, Kanshirei, 9. XI. 1926 (S. TOYOTA).

Allotype ♂ : Formosa, Kuraru, 31. VII 1931 (T. SHIRAKI).

Paratypes: Japan, Honshu (Kyoto-Kiyomizu) (Y. MATSUUDA), 1♂; Kyushu (Fukuoka-Hirao) 2♂♂.

The most remarkable features of this species are the strongly convex clypeus and the very slender discoidal cell. It runs very well in the original description of *E. riukiuensis* (MATS. & UCHIDA) except for scutellum without transverse ridge and ocellar triangle blackish. The tarsal claws are also distinctive, but in the males from Japan, the denticles are so short and numerous, as compared with female, that perhaps such difference is more than sexual dimorphism and these males are representing a second species.

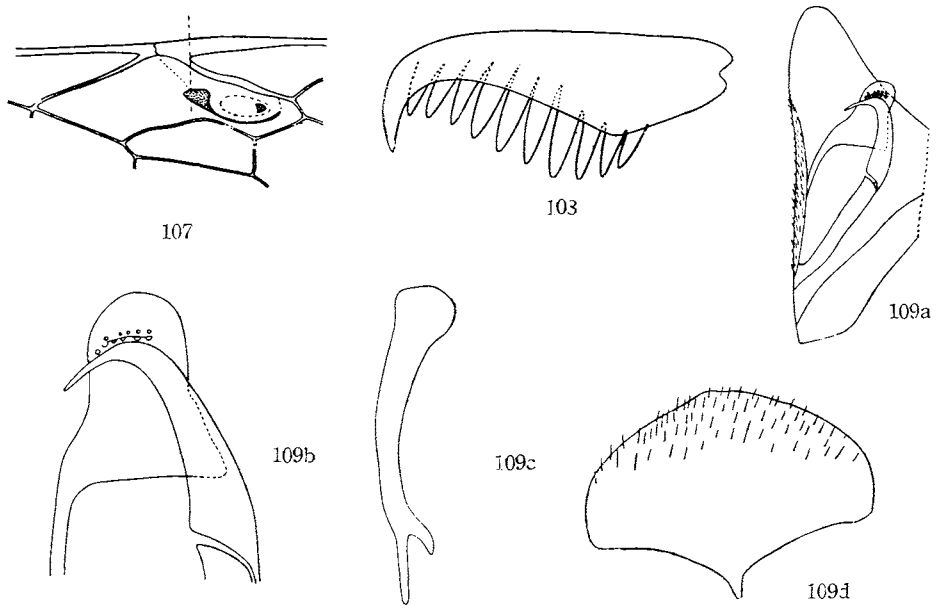
Enicospilus taiwanus (UCHIDA)

1928 *Henicospilus taiwanus* UCHIDA, Jour. Fac. Agric. Hokkaido Univ., 21:226-227, pl. 6, fig. 13, ♀. (Formosa: Tarowan, Kyuhabon, Baibara).

♀. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity poorly defined. Labrum about 3/4 as long as malar space. Clypeus about 15 x 25, evenly convex; trans-tentorial furrow scarcely recognizable, sides of face more densely punctate than supraclypeal region. Antenno-ocellar and latero-ocellar lines about 12:15. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 10:30.

Propleura finely punctate, with a few striae near scrobes. Mesopleura with fine punctures on superior 1/3 and numerous longitudinal striae on remaining 2/3, the sculptures becoming stronger towards inferior margins; mesopleural cavity small,

rounded and deep. Scutellum polished, laterally abruptly margined at base, the abruptness being gradually weakened caudad. Propodeum ellipsoid; apical area with a distinct median (often obsolete) and numerous strong, rather regular, oblique carinae; transverse ridge strong, arcuate.



Figs. 107-109. *Enicospilus taiwanus* (UCHIDA) ♂, fenestra (107), hind claw (108), male genitalia —109a. dorsal view of right-hand paramere (with volsella), 109b. right-hand volsella (more enlarged), 109c. right lateral plate of aedeagus, 109d. hypandrium.

Forewing 15 mm. long. Fenestra (Fig. 107) extending from base to apical 1/5 of 1st radial abscissa. Proximal sclerome hairless above and hairy below, with anterior margin nearly parallel to costa; appendix weakly sclerotized, running along posterior and thence apical margin of fenestra; quadra elliptical, medium-sized, with a small, roundish central sclerome at apical 1/4. Radius with 1st abscissa very weakly sinuate, thickest at middle and about 3/5 as long as 2nd abscissa; transverse brace approximately in the ratio 2:5:3.3 (18:45:30); 2nd recurrent and basal abscissa of subdiscoideus forming an acute angle, the latter about thrice as long as the former; nervulus interstitial or antefurcal. Superior and inferior nervellar abscissae about 28:11, the former and discoidella forming a narrow obtuse angle. Hind claw as in Fig. 108.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles at apical 1/3 and gastrocoeli, basad to middle.

♂. Essentially similar to female. Genitalia as in Fig. 109 (a-d).

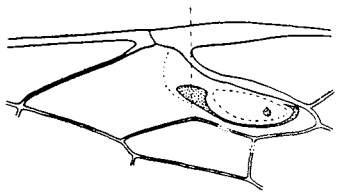
Formosa: Rarasan, 1♀; Shinchiku, 1♀; Sozan, 2♀♀; Taihoku, 4♀♀; Yeboshi (Rato-gun), 1♀.

Japan: Kyushu, 1♂; Gifu, 1♀; Oshima, 1♀.
Riu Kius: 1♂.

Enicospilus tristrigatus (ENDERL.)

1921 *Henicospilus tristrigatus* ENDERLEIN, Stett. Ent. Zeitg. 82:23, ♀. (Formosa: Pilam).

♂. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity triangular, poorly defined. Labrum about 1/2 as long as malar space. Clypeus about 15 x 25, moderately sparsely punctate, and moderately convex; anterior submarginal ridge poorly defined, very obscurely tuberculate at middle; transtentorial furrow broad, shallow. Sides of face more deeply punctate than supraclypeal region. Frontal tubercle oblong, improminent. Antennae slightly longer than body; antenno-ocellar and latero-ocellar lines subequal in length. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 15:28.



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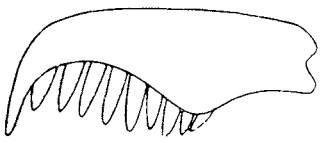

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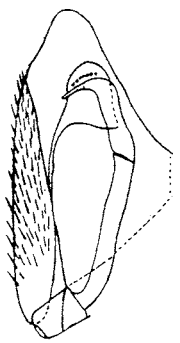

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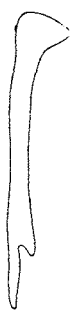

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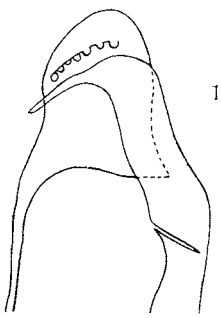


112b

Figs. 110-112. *Enicospilus tristrigatus* (ENDERL.) ♂, fenestra (110), hind claw (111), male genitalia—112a. dorsal view of right-hand paramere (with volsella), 112b. right-hand volsella (more enlarged), 112c. right lateral plate of aedeagus.

Propleura feebly, finely, punctato-striate, with a few moderately strong striae near scrobes. Mesonotum polished; mesopleura rather evenly and strongly carinate, with superior corners subpolished; mesopleural cavity small, rounded, rather deep. Scutellum subpolished, laterally sharply margined. Propodeum oblong; apical area with a few oblique carinae on basal 2/5 and numerous regular, arcuate ones on the rest; transverse ridge rather strong.

Forewing 9 mm. long. Fenestra (Fig. 110) very long, narrow, extending from

base to apical 1/5 of 1st radial abscissa. Proximal sclerome hairless above and hairy below, appendix long and slender; quadra oblong, well defined; central sclerome small, roundish; distal sclerome sickle-formed. Radius with 1st abscissa markedly thickened except for apical 1/8, about 3/7 as long as 2nd abscissa; transverse brace approximately 2:6 6: 4 (15:50:30); 2nd recurrent and basal abscissa of subdiscoideus forming a broad acute angle, the latter less than thrice as long as the former; 2nd discoidal cell broadest at middle; nervulus exactly interstitial. Superior and inferior nervellar abscissae about 25:11, discoidella and superior abscissa forming a narrow obtuse angle. Hind claw as in Fig. 111.

Abdominal segment I subequal in length to II, almost straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles at apical 1/3 and gastrocoeli, distinctly basad to middle. Genitalia as in Fig. 112 (a-c).

Testaceous. Mandibular apices, propleura (antero-lateral area), mesonotum, mesopleura (antero-inferior area), mesosternum, metapleura (most part), propodeum (basal half) and postpetiole dark brown to black; abdominal tergum III and IV (latero-posterior margins), V-VII (lateral part) brownish.

Allotype ♂ : Formosa, Horisha, 28. II. 1927 (I. ISSHIKI).

Further specimen: Formosa, Kobayashi (Rato), 1 ex. (♀ or ♂).

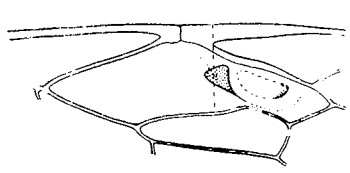
Enicospilus chalasmatos, sp. nov.

♀. Head smooth and shining, strongly narrowed behind eyes. Mandible strongly twisted, basal concavity lunular. Labrum about 2/3 as long as malar space. Clypeus moderately convex, about 20 x 32, with a few medium-sized, very scattered punctures, anterior submarginal ridge rather distinct; trans-tentorial furrow broad, shallow. Supraclypeal region shallowly punctate, sides of face much more densely so. Frontal tubercle oblong, prominent. Antenna nearly as long as body; antenno-ocellar and latero-ocellar lines subequal. Ocelli very prominent; ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 13:37.

Propleura evenly with weak, fine and sparse punctures. Mesonotum granulated; mesopleura closely, finely punctato-striate, inferior 1/3 somewhat more strongly so, superior 1/3 finely punctate; mesopleural cavity broad and very shallow. Scutellum sparsely punctate, sharply margined for the full length. Metapleura finely punctate, posteriorly coarsely wrinkled. Propodeum subelliptical; apical area with a few strong, widely separated carinae, the basal ones being oblique, rather irregular whereas the apical ones, arcuate and more regularly arranged; transverse ridge sharp, roundly curved.

Forewing 19 mm. long. Fenestra (Fig. 113) extending from base to apical 1/7 of 1st radial abscissa. Proximal sclerome triangular, hairless above and hairy below, basally obliquely truncate; appendix pretty long; quadra moderate-sized, well defined, antero-apical margin weakly sclerotized; distal sclerome linear.

Radius with 1st abscissa markedly thickened except for apical 1/3, about 2/3 as long as 2nd abscissa; transverse brace about 2:3:2.4 (35:52:42); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle; 2nd discoidal cell long, broadest at a point of apical 1/3; nervulus distinctly antefurcal. Superior and inferior nervellar abscissae about 37:12, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 114.



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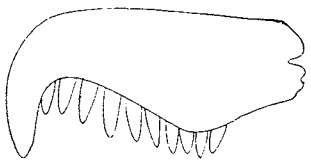

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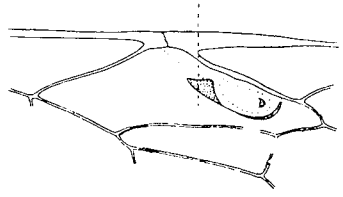

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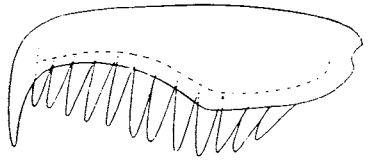


116

Figs. 113-116. Fenestrae and hind claws of *Enicospilus chalasmatos*, sp. nov. ♀ (113, 114) and *E. crucis*, sp. nov. ♀ (115, 116).

Abdominal segment I subequal in length to II, weakly curved in profile, apical width slightly greater than trans-spiracular width. Tergum II with spiracles at apical 1/3 and gastrocceli lying basad to middle.

Testaceous. Mandibular apices brown; mesonotum (apical 1/2), and mesonotal stripes fuscous (posterior third darkened; tegulae posteriorly dark brown; wings hyaline, scleromes, pterostigma and veins testaceous, subcosta, radius, media and basal veins darker; abdomen (excluding segment I and II fulvous, dorsal ridge black.

Holotype ♀: Formosa, Shonan-o (Rato, 11. XII. 1930 (Y. YANAZAKI).

Rather near *E. tristrigatus* and *E. taiwanus*. Besides the characters given in the synopsis couplet 38, it can be recognized from those two species by the comparatively broader tarsal claw and the more strongly curved transverse ridge of propodeum. The specific name "*chalasmatos*", a dislocation, is given in allusion to the central sclerome.

Enicospilus crucis, sp. nov.

♀. Head strongly narrowed behind eyes. Mandible strongly twisted; basal concavity lunular. Labrum about 1/2 as long as malar space. Clypeus about 18 x 25, moderately convex; anterior submarginal ridge subtuberculate at middle; transtentorial furrow scarcely recognizable; supraclypeal region and sides of face more

deeply punctate than clypeus. Frontal tubercle oval, rather prominent. Antenna ? ; antenno-ocellar line subequal to latero-ocellar line. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 15:34.

Propleura weakly punctate, somewhat striate near scrobes. Mesonotum finely, densely punctate; mesopleura with numerous dense striae (superior 1/3 moderately punctate) which are stronger and broader inferiorly; mesopleural cavity broad, rather shallow. Metapleura distinctly reticulated. Scutellum moderately punctate, laterally sharply margined. Propodeum roundish, apical area roughly, irregularly wrinkled, medially with longitudinal carinae and laterally coarsely reticulated; transverse ridge strong, arcuate.

Forewing 16 mm. long. Fenestra (Fig. 115) extending from basal 2/7 to apical 1/5 of 1st radial abscissa. Proximal sclerome hairy both above and below; quadra medium-sized; central sclerome subtriangular, weakly sclerotized. Radius with 1st abscissa slightly thickened near middle, about 3/5 as long as 2nd abscissa; transverse brace approximately in the ratio 2:3.4:2.6 (27:45:35); 2nd recurrent and basal abscissa of subdiscoideus almost perpendicular to each other, the latter about thrice as long as the former; 2nd discoidal cell long; discocubitus very weakly bisinuate; nervulus interstitial. Superior and inferior nervellar abscissae about 27:18, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 116.

Abdominal segment I subequal in length to II, feebly curved in profile, apical width subequal to trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

Testaceous. Mandibular apices, costa, pterostigma and most veins brown; ovipositor-sheath dark brown.

Holotype ♀ : Formosa, Jujiro (nr. Arisan), 26. IV. 1931 (T. SHIRAKI).

This species is very similar to *E. sakaguchii* (MATS. & UCHIDA) and is to be distinguished by face not sparsely, finely punctate, scutellum not densely, irregularly carinate and 2nd discoidal cell apically not so broad. The name *crucis*, a cross, is given in allusion to the propodeal sculpture and also for the type locality, "Jujiro", which means a cross-road.

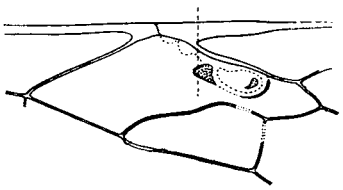
Enicospilus seniculus, sp. nov.

♀. Head slightly narrowed behind eyes. Mandible strongly twisted; basal concavity isoscelesly triangular. Labrum as long as malar space. Clypeus about 14 x 30, rather evenly convex, deeply punctate; trans-tentorial furrow poorly developed. Face closely, deeply punctate. Frontal tubercle roundish, prominent. Antenna shorter than body; antenno-ocellar line: latero-ocellar line about 10:14. Ocellar triangle rather raised. Greatest widths of temple and eye in profile about 20:27.

Propleura sparsely punctate. Mesonotum very finely and densely punctate;

mesopleura evenly, moderately sparsely punctate, with inferior 1/3 more or less striato-punctate; mesopleural cavity long, curve and shallow. Metapleura and scutellum evenly, sparsely, moderately punctate, the latter laterally sharply margined at base and abruptly weakly so at apical 1/2. Propodeum roundish, apical area with moderately strong, irregularly arranged carinae, which are somewhat longitudinal; transverse ridge strong, arcuate.

Forewing 15 mm. long. Fenestra (Fig. 117) extending from base to apical 1/4



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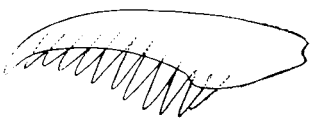


118

Figs. 117–118. *Enicospilus senilculus*, sp. nov. ♀, fenestra (117), hind claw (118).

of 1st radial abscissa. Proximal sclerome hairy both above and below; quadra ovoid; central sclerome weakly sclerotized. Radius with 1st abscissa slightly thickened near base, about 2/3 as long as 2nd abscissa; transverse brace approximately 2:3.3:3.1 (27:45:42); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter less than thrice as long as the former; discocubitus strongly undulated; 2nd discoidal cell broadest much apicad to middle; nervulus interstitial. Superior and inferior nervellar abscissae about 31:16, the former and discoidella forming an obtuse angle. Hind claw as in Fig. 118.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width subequal to trans-spiracular width. Tergum II with spiracles at apical 1/3 and gastrocoeli lying basad to middle.

Testaceous, mandibular apices brown.

Holotype ♀: Korea, Suigen, IV-VI. 1927 (K. SATO).

Paratypes: Korea, Suigen, 7♀♀.

The shape and site of the denticles on tarsal claws appear to be peculiar for this species. Their acuteness, obliqueness and uneven length well suggest the teeth of an old man, wherefrom the specific name is derived.

Enicospilus shikokuensis (UCHIDA), status nov.

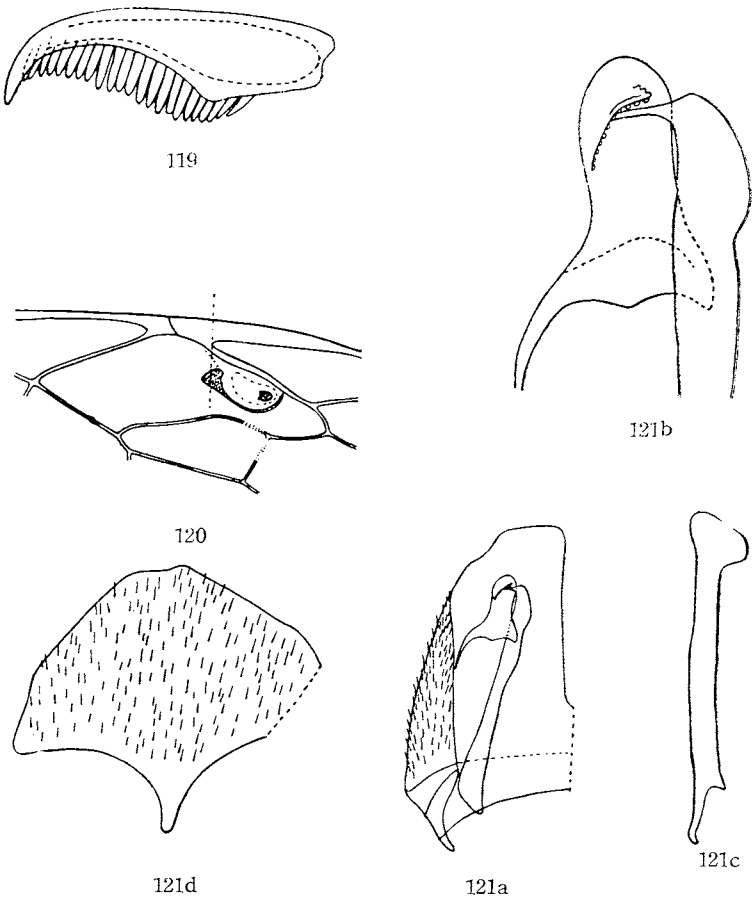
1928 *Henicos ilus combustus* var. *shikokuensis* UCHIDA, Jour. Fac. Agric. Hokkaido. Univ., 21:224, ♀♂. (Japan: Honshu, Shikoku).

♀♂. Head slightly narrowed behind eyes. Mandible strongly twisted; basal concavity equilaterally triangular. Labrum about 4/3 as long as malar space. Clypeus about 20 x 40, closely, deeply punctate, moderately convex; anterior submarginal ridge rather distinct; trans-tentorial furrow weak and curved; supraclypeal region striato-punctate. Frontal tubercle rounded, prominent. Antenno-ocellar and latero-

ocellar lines subequal. Ocellar triangle raised. Greatest width of temple and eye in profile about 20:30.

Propleura evenly, sparsely punctate, more or less intermixed with obscure striae. Mesopleura densely punctate, inferiorly more sparsely so; mesopleural cavity broad and rather deep. Scutellum sparsely punctate, laterally sharply margined. Propodeum roundish; apical area with a few moderately strong, somewhht longitudinal or irregularly zigzagged carinae; transverse ridge strong.

Forewing 18 mm. long. Fenestra (Fig. 119) extending from basal 1/5 to apical



Figs. 119-121. *Enicospilus shikokuensis* (UCHIDA), status nov. ♂, fenestra (119), hind claw (120), male genitalia—121a. dorsal view of right-hand paramere (with volsella), 121b. right-hand volsella (more enlarged), 121c. right lateral plate of aedeagus, 121d. hypandrium.

1/3 of 1st radial abscissa. Proximal sclerome hairy both above and below, anterior angle broadly rounded; quadra well-defined; central sclerome situated near apex of quadra, varied in size and shape; appendix linear; distal sclerome curve, slender,

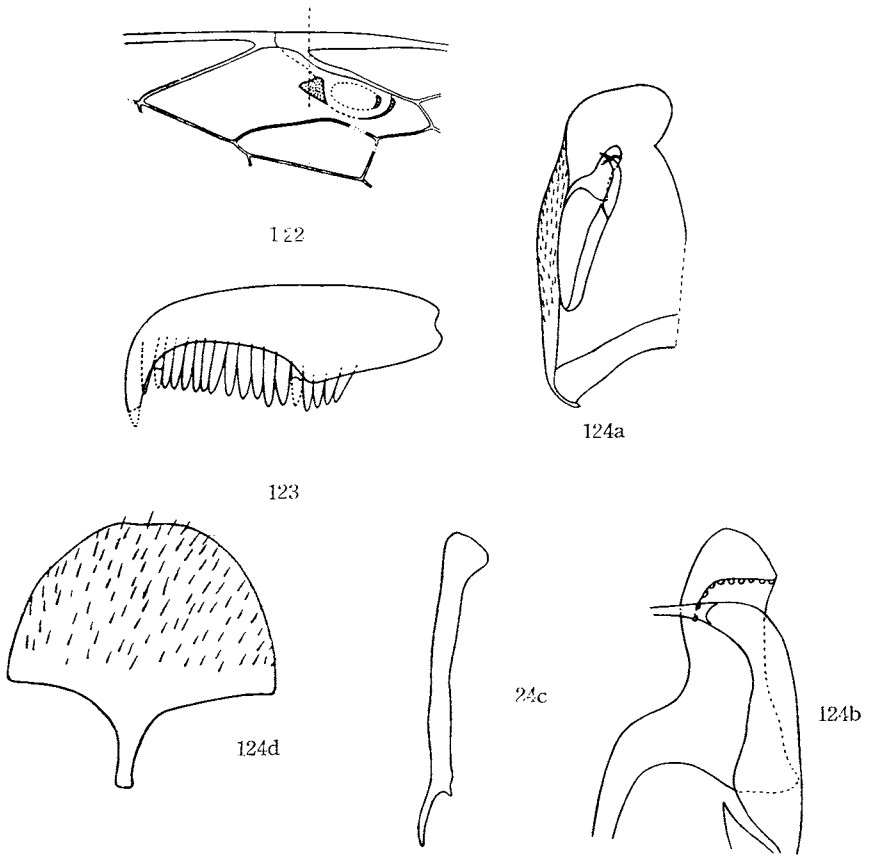
situated on apical margin of fenestra. Radius with Ist abscissa basally thickened, about 2/3 as long as 2nd abscissa; transverse brace approximately 2:3.5:2.5 (28:50:35); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle, the latter nearly thrice of the former; nervulus interstitial. Superior and inferior nervellar abscissae about 27:18; discoidella and superior abscissa forming almost a right angle. Hind claw and male genitalia as in Figs. 120 and 121 (a-d) respectively.

Abdominal segment I subequal in length to II, weakly curved in profile, apical width distinctly greater than or subequal to trans-spiracular width. Tergum II with spiracles lying basad to apical third and gastrocoeli, far basad to middle.

Testaceous. Mandibular apices, mesonotum, mesopleura (partially), and rarely metapleura also, slightly brown to blackish; wings hyaline, abdomen more or less brownish.

Formosa: Noko, 1♂

Japan: Tokyo, 1♀, 2♂♂; Yokohama, 1♂; uncertain locality, 1♂.



Figs. 122-124. *Enicospilus multidens*, sp. nov. ♀, fenestra (122), hind claw (123), male genitalia—124a. dorsal view of right-hand paramere, (with volsella). 124b. right-hand volsella (more enlarged), 124c. right lateral plate of aedeagus, 124d. hypandrium.

Enicospilus multidens, sp. nov.

♀. Head distinctly narrowed behind eyes. Mandible exceedingly strongly twisted; basal concavity lunular, rather polished. Labrum almost as long as malar space. Clypeus about 15 x 30, moderately convex; anterior submarginal ridge irrecognizable, except for a very obscure median tubercle; trans-tentorial furrow scarcely recognizable. Face closely, shallowly punctate. Frontal tubercle oval, improminent. Antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 12:35.

Propleura finely punctate, with a few striae near scrobes. Mesonotum finely punctate; mesopleura densely striato-punctate, inferiorly intermixed with few distinct striae; mesopleural cavity broad, shallow. Scutellum distinctly punctate, laterally sharply margined. Propodeum rounded; apical area with spasre, irregular carinae, medially with longitudinal carinae; transverse ridge moderately strong.

Forewing 19 mm. long. Fenestra (Fig. 122) extending from basal 1/4 to apical 1/4 of 1st radial abscissa. Proximal sclerome hairy both above and below; quadra oblong; central sclerome lunate; distal sclerome linear. Radius with 1st abscissa basally thickened, about 3/5 as long as 2nd abscissa; transverse brace approximately 2:3·8:2·9 (23:45:34); 2nd recurrent and basal abscissa of subdiscoideus forming a right angle, the latter about thrice as long as the former; 2nd discoidal cell broadest much apicad to middle; nervulus interstitial. Superior and inferior nervellar abscissae about 27:15, the former and discoidella forming almost a right angle. Hind claw as in Fig. 123.

Abdominal segment I slightly longer than II, feebly curve in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

Testaceous, mandibular apices brown.

♂. Similar to female. Genitalia as in Fig. 124 (a-d).

Holotype ♀: Japan, Minomo, 20. VII. 1918 (N. Tosawa).

Allotype ♂: Japan, Minomo, 31. IX. 1914 (N. Tosawa).

Paratypes: Japan, Osaka, 1♂,1♀; Daisen, 1♂.

This species can only be recognized by a combination of characters, among which the numerous long, slender denticles on tarsal claws appear to be the most distinctive, and as far as this character is concerned, it is superficially similar to *E. shikokuensis*.

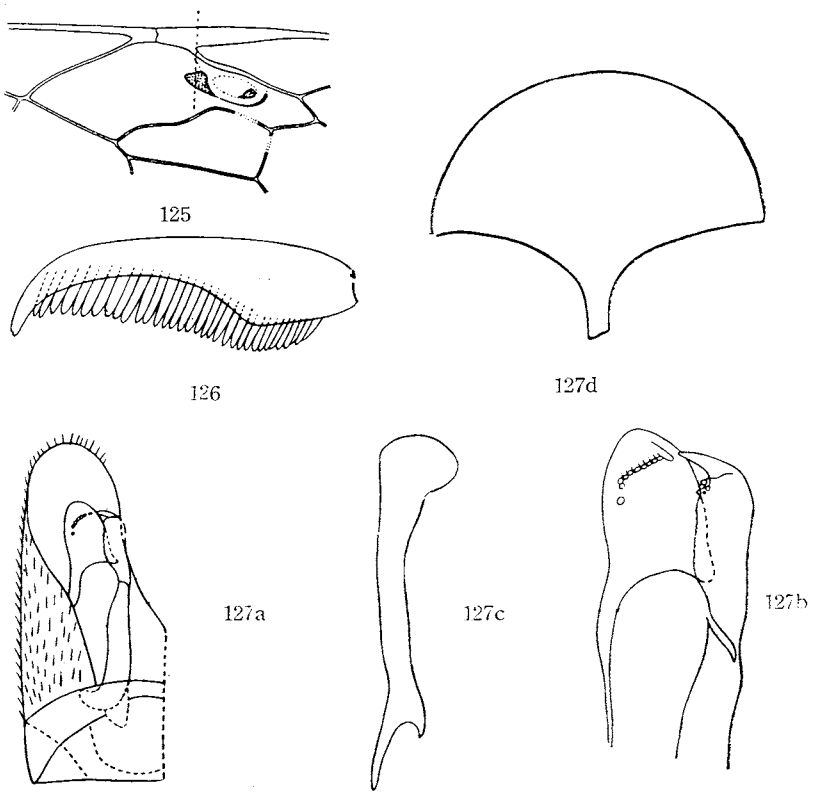
Enicospilus sigmatoides, sp. nov.

♂. Head very weakly swollen behind eyes. Mandible strongly twisted, basal concavity isoscelesly triangular, rather polished. Labrum about 1.5 as long as

malar space. Clypeus about 20 x 40, moderately punctate, anteriorly with a distinct submarginal ridge; trans-tentorial furrow shallow. Supraclypeal region moderately punctate; face proper finely, densely so. Frontal tubercle linear, improminent. Antenna shorter than body; antenno-ocellar and latero-ocellar lines about 10:16. Ocellar triangle moderately raised. Greatest widths of temple and eye in profile about 20:30.

Propleura finely, feebly punctate. Mesonotum finely punctate; meso- and metapiura moderately punctate, the inferior areas of the former more coarsely and sparsely so; mesopleural cavity broad, curved and shallow. Scutellum evenly, finely punctate, laterally sharply margined. Propodeum rounded, finely, irregularly rugose; transverse ridge strong arcuate.

Forewing 16 mm. long. Fenestra (Fig. 125) extending from basal 1/5 to apical 1/4 of 1st radial abscissa, proximal sclerome hairy both above and below; quadra medium-sized, well-defined; central sclerome comma-like; distal sclerome linear, a little more strongly sclerotized than appendix. 1st radial abscissa as in preceding species, and about 3/5 as long as 2nd abscissa; transverse brace approximately in the ratio 2:3.2:3.6 (25:40:45); 2nd recurrent and basal abscissa of subdiscoideus



Figs. 125-127. *Enicospilus sigmatoides*, sp. nov. ♂, fenestra (125), hind claw (126), male genitalia —127a. dorsal view of right-hand paramere (with volsella), 127b. right-hand volsella (more enlarged). 127c. right lateral plate of aedeagus, 127d. hypandrium.

forming a right angle, the latter less than thrice as long as the former; 2nd discoidal cell broadest apicad to middle; discocubitus basally distinctly bisinuate, nervulus distinctly antefurcal. Superior and inferior nervellar abscissae about 27:15, the former and discoidella forming a nearly obtuse angle. Hind claw and male genitalia as in Figs. 126 and 127 (a-d) respectively.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width subequal to trans-spiracular width. Tergum II with spiracles lying at apical 1/3 and gastrocoeli, basad to middle.

Testaceous. Face flavous, mandibular apices, mesonotal stripes, segment IV (apically) and following ones brown to dark brown.

Holotype ♂ : Korea, Suigen, 24. IV. 1930 (K. SATO).

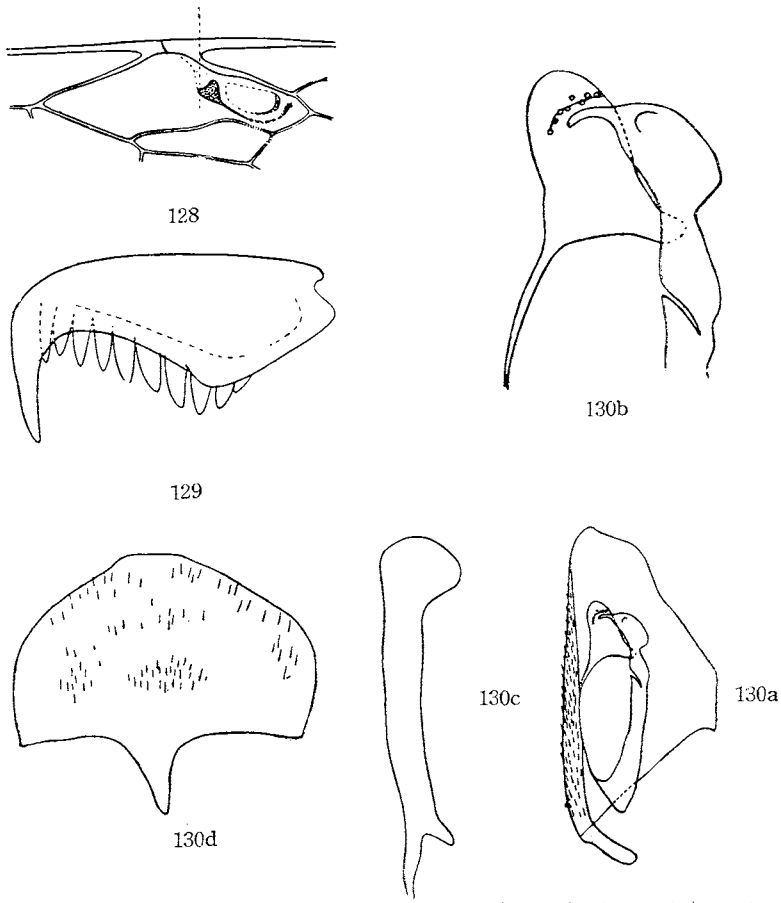
Near *E. shikokuensis*. The name "*sigmatoides*", S-shaped, is given for the undulation of the discocubitus. Besides the characters given in the synopsis (couplet 57), this species can be also distinguished from *shikokuensis* by the shape of 2nd discoidal cell and the relative thickness of 1st radial abscissa.

Enicospilus saepis, sp. nov.

♀. Head slightly narrowed behind eyes. Mandible strongly twisted, basal concavity poorly defined. Labrum and malar space subequal in length. Clypeus about 20 x 35, weakly, evenly convex, deeply punctate, discally with a rounded, rather distinct prominence; anterior marginal area polished; trans-tentorial furrow irrecognizable, supraclypeal region and sides of face a little more closely punctate than clypeus. Frontal tubercle oval, prominent. Antenna nearly as long as body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 18:48.

Propleura moderately punctate, with a few striae near scrobes. Mesonotum finely punctate; mesopleura superiorly densely, finely punctate, inferiorly somewhat coarsely striato-punctate; mesopleural cavity moderately deep. Scutellum laterally sharply edged at base, very weakly so at apex. Propodeum roundish, apical area with coarse reticulation and a very prominent carina; transverse ridge undulated.

Forewing 18 mm. long. Fenestra (Fig. 128) extending from basal 1/6 to apical 1/7 of 1st radial abscissa. Proximal sclerome cordate, hairless above and hairy below; appendix as well as distal sclerome linear, the latter often more weakly sclerotized but apically broadened; quadra large, well-defined, apically with a sickle-formed central sclerome. Radius with 1st abscissa basally weakly curved and thickened, about 3/5 as long as 2nd abscissa; transverse brace approximately 2:3.5:2.5 (28:50:35); 2nd recurrent and basal abscissa of subdiscoideus forming an obtuse angle, the latter about thrice as long as the former; 2nd discoidal cell broadest at a point of apical third; nervulus distinctly antefurcal. Superior and inferior



Figs. 128-130. *Enicospilus saepis*, sp. nov. ♂, fenestra (128), hind claw (129), male genitalia —130a. dorsal view of right-hand paramere (with volsella), 130b. right-hand volsella (more enlarged), 130c. right lateral plate of aedeagus, 130d. hypandrium.

nervellar abscissae about 35:15, the former and discoidella forming an obtuse angle.

Abdominal segment I subequal in length to II, nearly straight in profile, apical width greater than trans-spiracular width. Tergum II with spiracles lying basad to apical 1/3, gastrocoeli, far basad to middle.

Testaceous. Mandibular apices and median mesonotal stripe brownish; veins mostly dark brown; abdominal segments III-VI (dorsal ridge) and followings brownish.

♂. Essentially similar to female. Hind claw and genitalia as in Figs. 129 and 130 (a-d) respectively.

Holotype ♀: Japan, Nara. 17. VIII. 1918 (J. SONAN).

Allotype ♂: Formosa, Shinten, 1. V. 1938 (J. SONAN).

Paratypes: Formosa, Sozan, 1♂. Japan, Mt. Kunimi, Hizen, Kyushu, 1♂; Minomo, Osaka, 1♂.

The name *"saepis"*, a fence or hedge, is proposed in allusion to the fence-like carinae surrounding the petiolar area of propodeum.

Enicospilus concentralis CUSHMAN

1937 *Enicospilus concentralis* CUSHMAN, Arb. morph. tax. Ent. Berl.-Dahl. 4(4):305, fig. 2, ♀ ♂. (Formosa: Kankau).

The following notes may be supplementary to the description by CUSHMAN.

♀. Mandible exceedingly strongly twisted, basal concavity short, poorly defined. Labrum about 2/3 as long as malar space. Clypeus about 18 x 35; trans-tentorial furrow broad, shallow. Supraclypeal region rather clearly defined. Frontal tubercle ovoid, rather prominent. Antenna longer than body; antenno-ocellar and latero-ocellar lines subequal. Ocellar triangle slightly raised. Greatest widths of temple and eye in profile about 10:30. Mesopleural cavity short, rather shallow. Forewing 13 mm. long. Nervulus antefurcal. Superior and inferior nervellar abscissae about 27:10, the former and discoidella forming a right angle. Hind claw as in Fig. 131. Abdominal segment I subegual in length to II, and with apical width greater than trans-spiracular width.

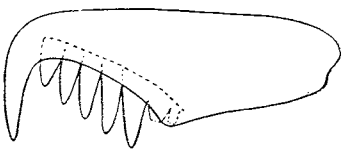


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Fig. 131. Hind claw of *Enicospilus concentralis* CUSHMAN, ♀.

Formosa: Taito, 1♀.

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